Kabwe Municipal Council

Kabwe District State of Environment Outlook Report




August 2010

ENVIRONMENTAL COUNCIL OF ZAMBIA
CARING INTO THE FUTURE

Kabwe Municipal Council

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KABWE DISTRICT STATE OF ENVIRONMENT OUTLOOK REPORT

MAIN REPORT

A report by Kabwe Municipal Council, Environmental Council of Zambia and stakeholders

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DISCLAIMER

The opinions, figures and estimates set forth in this publication should not necessarily be considered as reflecting the view or carrying the endorsement of KMC and ECZ.

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FOREWORD

Zambia's ecosystems are varied and able to support a wide range of livelihoods. For this reason, measures need to be put in place so as to prevent the degradation of our natural resources and protect the environment. In order to protect the country's natural resources, Government has established legal and institutional frameworks to guide environmental management by enacting laws and regulations and developing plans and programmes. These include the;

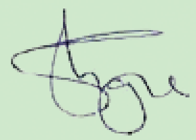
i. National Conservation Strategy (NCS) of 1985;
ii. National Environmental Action Plan (NEAP) of 1994;
iii. Environmental Protection and Pollution Control Act (EPPCA) of 1990 which led to the subsequent establishment of ECZ in 1992;
iv. National Policy on Environment (NPE) of 2007;
v. Vision 2030;
vi. Fifth National Development Plan which was developed to guide medium and long term development goals; and
vii. Environment and Natural Resources Management and Mainstreaming Programme (ENRMMP) aimed at improving coordination and implementation capacity for environment and natural resources management and response strategies.

Government is committed to improved environmental management and consequently, sustainable development of Zambia as demonstrated through the NPE whose purpose is to ensure that socio-economic development is achieved effectively without damaging the integrity of the environment or its resources.

Government further recognises that achieving sustainable development in Zambia requires access to data and information so that those involved in decision making can reach the level of knowledge and understanding needed for successful programme planning and service delivery.

The Kabwe District State of Environment (SoE) Outlook report is a product of an Integrated Environmental Assessment (IEA), a process of producing and communicating policy-relevant information on key interactions between the natural environment and society. The report will assist in increase awareness and general understanding of environmental trends and conditions by showing linkages between causes and consequences of environmental degradation as well as identify actions which must be taken to mitigate or prevent adverse environmental effects in Kabwe district.

It therefore follows that the report will serve as a powerful environmental management planning tool for Kabwe Municipal Council by allowing for planning to have an overall assessment of the interaction between the obtaining environmental conditions in the district and socio-economic activities. It is expected to strengthen management and monitoring of environmental issues at district level and improve service delivery in Kabwe.



Hon. Catherine Namugala, MP
MINISTER OF TOURISM, ENVIRONMENT AND NATURAL RESOURCES

PREFACE

The Kabwe District State of Environment (SoE) Outlook report was prepared by a group of technical experts from various institutions of the district. The report emphasises the importance of environment in the district and attempts to create an understanding of the interaction of society and the environment. The purpose of the report is to improve upon knowledge on the state of environment of Kabwe district and its change overtime and contribute to the planning and development of the district.

Kabwe district is located in the Central Province of Zambia and is surrounded by Kapiri Mposhi in the north and Chibombo in the south. It has a total surface are of 1,570 km^2 (TSB-MRS 2010). It is located between latitude 14^o 27' South and longitude 28^o 27' East on the central plateau. It lies along the Great North Road, some 139km north of Lusaka and about 55km from Kapiri Mposhi in the north. The topography has a dominant gradient from southwest to northeast at an average slope of approximately 4m/km.

Kabwe district had a population of 178,341 (CSO, 2001). The growing population has put pressure on demand for land, natural resources and provision of social services. For this reason, t is important to consider environmental issues in the planning process so as to achieve sustainable development in the district.

Preparation of this report started in November, 2009, as an initiative from the Environmental Council of Zambia (ECZ) with support from the Ministry of Tourism, Environment and Natural Resources (MTENR) under the Environment and Natural Resources Mainstreaming and Management Programme (ENRMMP). The process started with consultative meetings with stakeholders which included Government departments, private sector and civil society. These stakeholders formed the district Technical Working Group (TWG) whose task was to identify major environmental issues facing the district, develop environmental indicators, collect data and report writing. Kabwe Municipal Council (KMC) facilitated the production of the report as a lead agency in the district. The TWG was trained in Integrated Environmental Assessment (IEA) and reporting and a workshop was held to validate the draft report.

The report focuses mainly on assessing the pressures the environment is facing and analyses actions aimed at enhancing environmental management at district level. It goes a step further to propose policy options for addressing environmental challenges. Some of the key issues covered in the report include; provision of basic services such as education, health and housing, HIV/AIDS, land degradation, waste management, water and sanitation and energy.

The challenge is for various stakeholders in the district to utilise the report for planning and decision making at all levels. We must therefore use this document as a tool in the management of the environment in the district. I wish to take this opportunity to thank members of the TWG for their commitment throughout this process. I further wish to thank the MTENR and ECZ for providing financial and technical support respectively for production of the report.

T. Sinkala

Teddy Sinkala
KABWE MAYOR

Table of Contents

List of Figures

List of Boxes

ACKNOWLEDGEMENTS

Kabwe Municipal Council (KMC) and members of the Technical Working Group (TWG) would like to thank all stakeholders especially institutions represented on the TWG for contributing to the production of the Kabwe District State of Environment (SoE) Outlook report. In particular, the efforts of Environmental Council of Zambia (ECZ) in guiding the process of producing this report are commendable.

Financial support towards the process of the report has been provided by Ministry of Tourism, Environment and Natural Resources as part of implementation of the Environment and Natural Resource Mainstreaming Programme (ENRMMP). We further wish to thank the many institutions and individuals that made specific contributions to the information contained in this report.

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ACRONYMS AND ABBREVIATIONS

AIDS	-	Acquired Immune Deficiency Virus
CEP	-	Copperbelt Environment Project
CSO	-	Central Statistical Office
DACO	-	District Agricultural Coordinator
DC	-	District Commissioner
DHO	-	District Health Office
DPSIR	-	Driver, Pressure, State, Impact and Response
DSA	-	District Situation Analysis
ECZ	-	Environmental Council of Zambia
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EPICs	-	Environmental Public Information Centers
FRA	-	Food Reserve Agency
FDI	-	Foreign Direct Investment
GDP	-	Gross Domestic Product
GEF	-	Global Environmental Facility
GIS	-	Geographical Information Systems
GHG	-	Green House Gases
GRZ	-	Government of the Republic of Zambia
HIPC	-	Highly Indebted Poor Countries
HIV	-	Human Immune Virus
ICM	-	Integrated Case Management
IEA	-	Integrated Environmental Assessment
ITCZ	-	Inter-tropical Convergence Zone
MACO	-	Ministry of Agriculture and Cooperatives
MEWD	-	Ministry of Energy and Water Development
KCLMC	-	Kabwe Community Lead Management Committee
KDHO	-	Kabwe District Health Office
KIFCO	-	Kabwe Industrial Fabrics Company
KSDS	-	Kabwe Scoping and Design Study
KMC	-	Kabwe Municipal Council
NEAP	-	National Environmental Action Plan
NGOs	-	Non Governmental Organisations
ODA	-	Overseas Development Aid
OECD	-	Organization for Economic Cooperation and Development
PFAP	-	Provincial Forestry Action Programme
PPPs	-	Public Private Partnerships
POPs	-	Persistent Organic Pollutants
RDF	-	Roads Development Fund
ROADSIP	-	Road Sector Investment Program
RSZ	-	Railway System of Zambia
SEA	-	Strategic Environmental Assessment
SoE	-	State of Environment
STIs	-	Sexually Transmitted Infections
RTSA	-	Road Traffic and Safety Agency
UNDP	-	United Nations Development Programme
TORs	-	Terms of References
WECSZ	-	Wildlife and Environmental Conservation Society of Zambia
WHO	-	World Health Organisation
ZRL	-	Zambia Railways Limited

EXECUTIVE SUMMARY

The Kabwe District State of Environment (SoE) Outlook Report has been prepared as a supplementary tool to aid socio-economic development planning of the district with a focus on environmental sustainability. The report was prepared through a participatory process involving local stakeholders who are the key custodians of planning information through a process of Integrated Environmental Assessment.

The report is structured around key issues of environmental concern in Kabwe. The said environmental issues of concern have been discussed under two broad categories namely the natural or biophysical environment and the socio-economic and cultural environment and these have been consolidated into the following thematic chapters:

1. Socio-economics;
2. Minerals Resources;
3. Water and Sanitation; and
4. Land

The thematic chapters and associated issues of concern are discussed starting with an elaboration of the obtaining status and associated impacts followed by a review of trends in the drivers and pressures responsible for the obtaining status. Discussion of trends is then followed by a review of current interventions aimed at addressing the identified issues of concern under each thematic chapter with a view to identification of intervention gaps. Finally, solutions are identified for overcoming the identified gaps at both the policy and strategic level. Scenarios for each alternative intervention options are also discussed at both the current level of interventions and at the alternative course of action to show the likely future scenario. Key issues under each thematic chapter are summarized as follows:

Socio-economics

The main indentified challenges in the district include limited access to provision of basic services such as water and sanitation, waste management, education and health facilities. Kabwe had a population of 178,341 distributed across its 26 wards and 2 constituencies. It annual population growth rate was 0.5 percent. Although the population of Kabwe has continued to steadily grow, the population growth rate has been on the decline from below 7 percent between 1969 and 1980 to 0.5 percent between 1990 and 2000 (CSO, 2001). The population of the district is projected to grow from 178,341 to 324,596 by 2010.

The district has facilities which provide some first level services but severe cases are referred to the provincial hospital (Kabwe General Hospital). The district has an HIV prevalence rate of 20.3percent among adults 15 to 45 years of age. This is more than Zambia's estimated HIV prevalence of 14.3percent for 12.3percent in men and 16.1percent in women.

Since the highest population of the district is concentrated in the peri-urban areas, there is increased pressure on provision of basic services in such areas which include water and sanitation, waste management, education and health facilities.

Mineral Resources

The key environmental issues of concern associated with mineral resources in Kabwe are land degradation and air pollution. Kabwe's mining and mineral processing operations were undertaken during a period when statutory environmental controls within the mining sector were almost non-existent. During the later years of Zambia Consolidated Copper Mines (ZCCM) operations, poor economic performance also undoubtedly inhibited environmental due diligence. Closure of the mine in 1994 consequently left a substantial legacy of environmental hazards some of which persist today.

Although Kabwe is no longer a key mining town since the closure of the mine in 1994, mining liabilities accumulated over the long years of mineral resource exploitation has left an indelible mark on the town's foot print requiring mitigation. Lead contaminated mine dumps have been identified as a major health hazard in the district.

Therefore, interventions needed to reverse the trend and improve environmental management include stabilisation of mine waste dumps, public awareness raising, tree planting and enforcement of pollution standards. A number of interventions have been undertaken by ZCCM-IH in this regard together with civil society groups and more interventions are required to address the problem effectively.

Water and Sanitation

Kabwe is rich in both surface and ground water resources. However, availability and accessibility of water for different use categories remains a challenge to the majority of Kabwe residents. Over 58percent of Kabwe residents depend on hand dug wells for domestic water supplies and only about 29percent have piped water supplied to their homesteads leaving the majority to share the available communal taps. This situation hampers productivity as time is lost in walking distances to the nearest water point. Sanitation is also compromised due to inadequate access to clean water and centralized sewer systems. Over 64.2percent of Kabwe residents use pit latrines as their main form of sanitation and 10percent are left without any form of sanitation. The majority of people in this category are dependent on hand dug wells thereby further compromising public health.

Service delivery has however improved over time but more households require access to clean water and improved sanitation. Identified interventions include:

- Policy review and enforcement on allocation of residential plots to ensure that only areas serviced with water supply are allocated;
- Enhanced enforcement of the Town and Country Planning Act to halt establishment of unplanned settlements and upgrading of such settlements to allow for provision of services;
- Expanding the capture of Lukanga Water and Sewerage coverage in water and sanitation services supply.

Land

Kabwe district is predominantly urban and leasehold characterise the main form of land tenure with periods ranging from 14 to 99 years. Demand for land in the district has been increasing. The main land use types found in Kabwe are residential, industrial, commercial, agriculture and forestry. Inappropriate use of land for various purposes including unplanned settlements and encroachment on forest reserves is a major area of concern.

Consequently, there is need to build institutional capacity of KMC to enable it meet the planning needs of the district in line with the population and development challenges. There is need to improve land use and provision of basic services in the district such as sanitation and other infrastructure.

Scenarios and Policy Options

The future is inherently uncertain and unpredictable. Despite the uncertainty of outcomes, forward looking analyses can be conducted. Scenarios are indispensable tools for environmental management that focus on large-scale, long-term interactions between development and environment (UNEP; 2006, 412). They are an outline of a natural or an expected course of events and are neither predictions nor forecasts. Rather, each scenario is one alternative image of how the future might unfold. Scenarios will vary considerably with the intended uses. They are useful tools for assessing either the future implications of current environmental problems or emergence of new problems.

The chapter discusses possible scenarios within the context of thematic areas. The base year used for this report is 2000 and the time horizon is upto 2030 in line with the country's Vision 2030. The chapter provides three scenarios namely the; (i) Business As Usual (ii) Policy Reform and (iii) Investment Scenarios.

In the **Business as usual Scenario,** an analysis of the current situation for each thematic area has been conducted. The scenario recognises various interventions being undertaken to achieve sustainable development. Further, analyses of the consequences of not taking appropriate actions and their impact on the environment have been discussed.

The **Policy Reform Scenario** recognises that in order to achieve sustainable development in the district, there is need to develop policies that support economic growth and appropriate levels of service delivery. It proposes policies that need to be put in place and implemented to address specific and probable problems that arise in the various sectors. These include policies that support improved planning, service delivery and compliance to set regulations. This scenario also acknowledges the need for active participation of stakeholders in national development.

In response to issues and policies identified in the Business As Usual and Policy Reform Scenarios, the **Investment Scenario** proposes investments required in the identified sectors to improve the district's socio-economic status. This scenario recommends economic and industrial growth, technological innovation, value addition and improved provision of resources as key elements to sustainable development.

The chapter also proposes policy actions that can be undertaken for all the themes discussed in the report.

1. INTRODUCTION

1.1 Background to State of Environment Outlook Reporting

Management and communication of environmental information is fundamental to the mission of the ECZ. The institution is mandated to monitor and report on the state of environment and associated environmental trends and hence the need for regular environmental assessments. State of Environment outlook reporting plays an important role in awareness creation and facilitates better understanding of the environmental trends, their causes and consequences for society. This information thus provide a foundation for improved decision making at all levels and also facilitates the measurement of progress towards sustainable development. It is for this reason that ECZ embarked on the SoE reporting process which started in 1994.

In addition to the national SoE reporting process, the country has been improved to include environmental assessment at district level. Four district SoE Outlook reports have were produced on a pilot basis namely; Lusaka, Chipata, Solwezi and Livingstone. Additional district reports have been produced for Kabwe and Kitwe. The two reports are being produced as part of implementation of the Environment and Natural Resources Management and Mainstreaming Programme (ENRMMP), a programme aimed at improved coordination and implementation capacity in the Environment and Natural Resources (ENR) sector.

SoE Outlook Reports focus on the interaction between society and their environment by assessing the pressures the environment is facing and analysing actions needed to address those pressures at both the policy and project levels. Findings of the assessments are reported and publicised thereby allowing stakeholders to have an in-depth understanding of the issues at hand and identify their role in addressing the challenges. This ultimately enhances environmental monitoring, planning and management at the district level and is key to attaining sustainable development.

The tool used in this kind of assessment is Integrated Environmental Assessment (IEA) defined as a process of producing and communicating policy relevant information on key interactions between the natural environment and society. It answers five questions that are key to effective decision making. These are:

(1) What is happening to the environment and why?
(2) What is the consequence for the environment and humanity?
(3) What is being done about it and how effective is it?
(4) What could be alternative futures of environmental sustainable (or unsustainable) development?
(5) What alternative action could be taken?

As noted above, typical SoE reports give an update on the biophysical and social economic status of a given area. Such information may include both quantitative and qualitative data on the biophysical environmental e.g. water resources, land resources, forest resources, wildlife resources, climatic conditions, air quality, etc and the social environment e.g. human population, literacy levels, livelihoods, food security, poverty levels, industrial development, social services etc. Such reports are also able to show trends by comparing previous assessments with current ones thereby making it possible to interpret whether or not the situation is improving or deteriorating.

SoE outlook reports however go a step further by analysing the causative factors behind the changes and further create scenarios of likely outcomes of action and/or inaction in relation to obtaining trends. As noted in the five questions, such analyses allow decision makers to have an opportunity to assess the need for action and compel them to move in and implement measures that are aimed at addressing the situation.

It therefore follows that SoE Outlook reports serve as a powerful environmental management planning tool for Local Authorities as they allow for planning to have an overall assessment of the interaction between the obtaining environmental conditions in the district and socio-economic activities.

1.2 Introduction to the Kabwe District SoE Outlook Report

The Kabwe District SoE Outlook Report discusses the status and impacts of environmental issues of concern in the district. The report further provides a review of responses currently under implementation to address the problems followed by scenario development on the likely future environmental status based on a range of policy options.

The reporting framework selected for the SoE Outlook Report was the environmental process framework which emphasises the Driving Force-Pressure-State-Impact-Response (DPSIR) analysis model and highlights the interactions among society, economy and the environment.

i. **Drivers** are activities and processes that cause pressures such as agriculture, industries, consumption, demographics and governance.
ii. **Pressures** are often classified into underlying forces such as population growth, consumption or poverty. The pressures on the environment are often considered from a policy perspective as the starting point for tackling environmental issues.
iii. **State** refers to the state of the environment resulting from the identified pressures; for example, the level of air pollution, land degradation or deforestation. The state of the environment will in turn affect human health and well-being as well as the socio-economic fabric of society.
iv. **Impacts** are long term results of activities. They are the effects due to the changes in the state of the natural environment. This could include consequences on health, nutrition, economic loss, floods, siltation etc.
v. **Response** component of Pressure-State-Response model corresponds to societal actions taken collectively or individually to ease or prevent negative environmental impact, correct environmental damage, or conserve natural resources. Responses may include regulatory action, environmental or research expenditures, public opinion and consumer references, changes in management strategies and providing environmental information.

The DPSIR framework has been used to discuss the thematic issues of the report (Socio-economics, Mineral Resources, Water and Sanitation and Land).

The major limitation in producing this report was inadequate information availability at district level as much of the information is generated at provincial and national levels. In addition, the bureaucracy in some organisations presented difficulties in collecting and analysing data.

2.0 BACKGROUND

2.1 Kabwe District – Geographical Location and Historical Perspective

Kabwe district is located in the Central Province of Zambia and is surrounded by Kapiri Mposhi in the north and Chibombo in the south. It has a total surface are of 1,570 km^2 (TSB-MRS 2010). It is located between latitude 14^o 27' South and longitude 28^o 27' East on the central plateau. It lies along the Great North Road, some 139km north of Lusaka and about 55km from Kapiri Mposhi in the north. The topography has a dominant gradient from southwest to northeast at an average slope of approximately 4m/km.

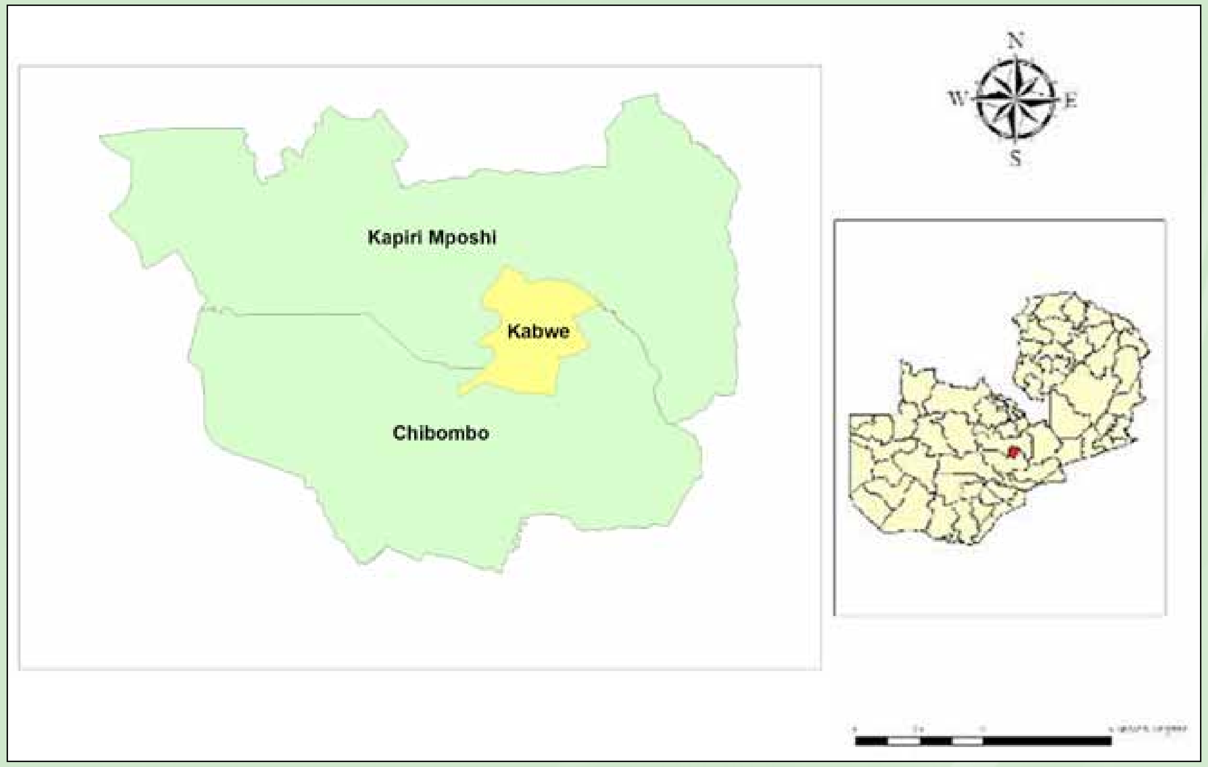

Figure 2.1: Location of Kabwe in Central Province, source ECZ 2010

The District Situational Analysis (DSA) report of 2003 provides historical information on Kabwe. Kabwe derives its name and existence from the rock of ore of zinc and lead. The name Kabwe is short for "Kabwe Ka Mukuba" meaning the stone of ore or the place of smelting. As result of the significance this ore was to the local people, the old motto for the town was "from the earth we derived our being".

In 1902, a mining engineer T.G. Davey on the lookout for signs of copper stumbled on a curiously shaped hill known to the local people as Mutwe wa Nsofu or Elephant head. Exploring the head more closely, he discovered rich outcrops of lead and zinc. The formation of the deposits was similar to that in Broken Hill mines of Australia.

In the early days, problems started as deposits containing lead and zinc could not at first be economically separated and the mine closed down. The mine reopened and the farming industry began to grow to serve the town. Northern Rhodesia Railway made Kabwe its headquarters. Locomotive sheds and marshalling yards were established and government organised its administrative headquarters for Central Province. The Central African Road Services (CARS), then the largest passengers and haulage company in the country, set up a depot and made Kabwe its headquarters and it became a gateway to East Africa. It was declared a village in 1915, township in 1930 and a municipality in 1954 and the first mayor was Mr. A.G Easton.

In 1921, a skull of primeval man was unearthed dating back to 50,000 years before Christ. The skull is at present being kept in the British Museum. Efforts are still being made to bring this piece of historical importance back to Kabwe. Kabwe is also regarded as the cradle of Zambia's independence as crucial decisions leading to independence in 1964 were made at a rock outcrop by the Mulungushi River.

2.2 Geographic Features and Climate

Kabwe like the rest of Central Province has a sub tropical climate that is modified by altitude. The annual pattern of weather is largely determined by the movement across the country of the Inter-Tropical Convergence Zone (ITCZ) with three distinct seasons; a cool dry season from April to August, a hot season from September to October and a rainy season from November to April.

a. Temperature

As shown in Table 2.1, the average temperature over Kabwe is similar to the rest of Central Province.

Table 2.1: Temperatures in Kabwe and Central Province

Area	Altitude (m.a.s.l)	Annual Mean °C	Monthly Average Maximum		Monthly average Minimum	
			Month	Temp.°C	Month	Temp.°C
Central Province (Average)	1207	20.2	Oct.	26.8	July	14.2
Kabwe (Average)	1207	20.2	Oct.	26.8	July	14.2

Source: Zambia Meteorological Department, 2008

Rainfall

The average total annual rainfall in Kabwe is 966mm. The rainy season occurs between October and April. December and January are the wettest months. Due to the high temperature prevailing in the area, evapo-transpiration is high and exceeds precipitation.

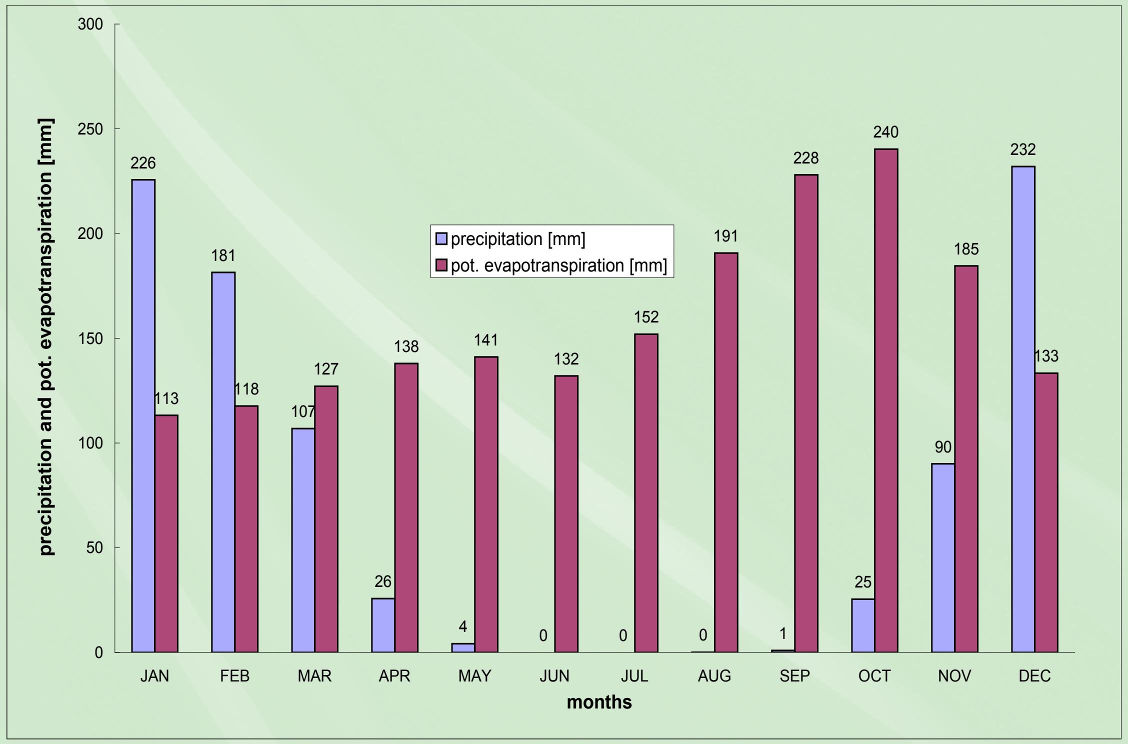

Figure 2.2: Precipitation and Potential evapotranspiration climograph

b. Relative Humidity

The average annual humidity in Kabwe is 63.5 percent. The highest yearly humidity is reached during the rainy season in the months of December to April, ranging between 72 percent and 81 percent. In contrast, the lowest humidity of between 41 percent to 44 percent prevails during the hottest months, September and October.

c. Sunshine and Winds

The mean annual sunshine duration is 8.2 hours per day. During the period of less rainfall (April to October) when the days are longer, the sunlight period of between 8.7 and 10.2 hours per day is experienced. The shortest sunshine duration is during the months of higher precipitation (December to February) ranging from 5.7 to 5.9 hours per day. Prevailing winds are predominantly easterlies though there are variations during the rainy season. The average annual speed in Kabwe is around 5 knots gusting to 10 to 17 knots during the month of August to October. The monthly minimum wind speed is measured from January to March ranging between 3 to 4 Knots. This is illustrated in figure 2.3

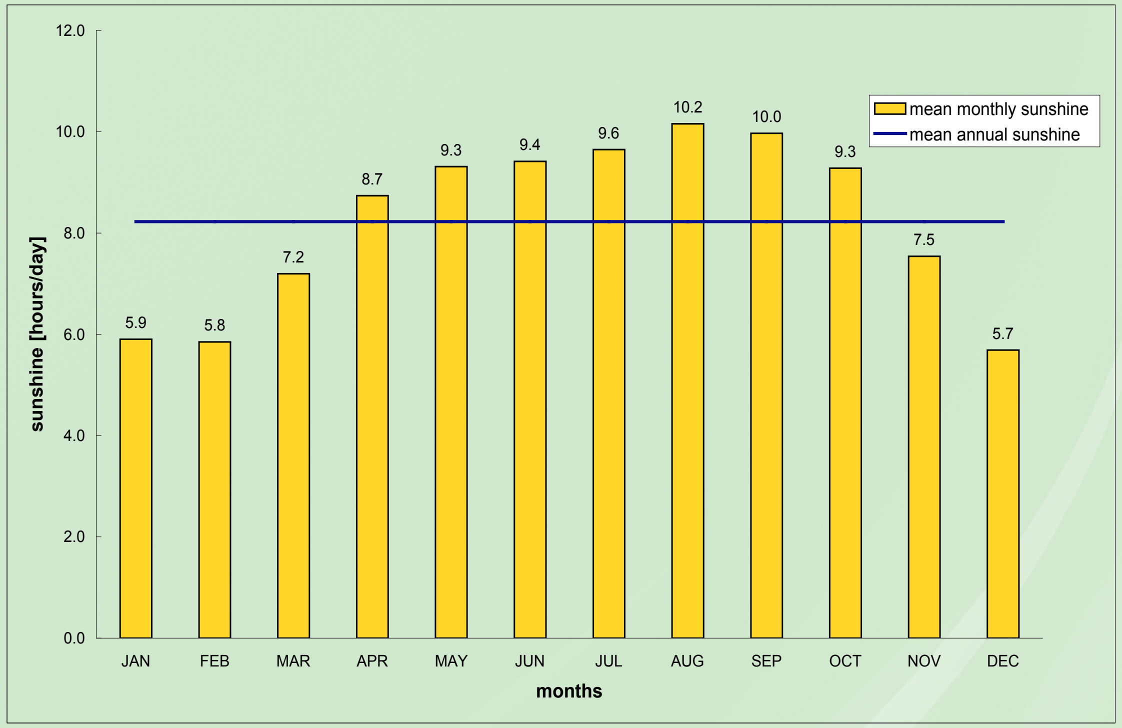

Figure 2.3: Distribution of Mean Monthly Sunshine for Kabwe

d. Vegetation

Vegetation in Kabwe is predominantly Miombo woodland. Chipya, Munga, Termitaria and grassland types of vegetation are also found as shown in Figure 2.4.

The main species of trees are Brachystegia and Combreturm species. However there are no appreciable commercial trees species except for secondary generations of Pterocarpus angolensis (Mukwa) and Albizia species. Kabwe has also open grasslands and termitaria ecotypes.

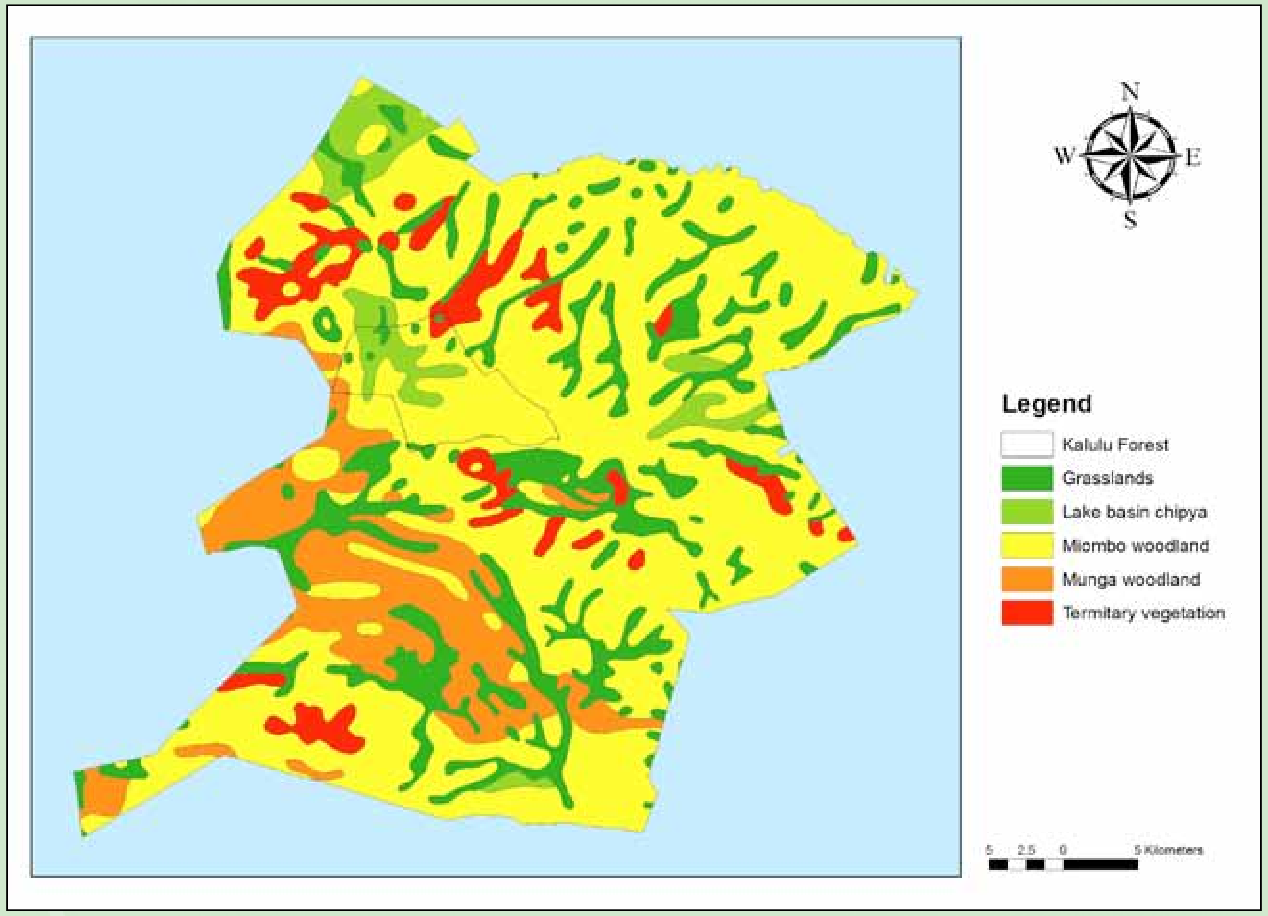

Figure 2.4: Vegetation Types in Kabwe
Source: Forestry Department, 1975

e. Soils

Two principal soil types occur in Kabwe, the distribution of which displays a strong bedrock lithological control. Soils of Kabwe are classified by Trupnell in Clayton (1980) as Sandveldt. According to the term Sandveldt, the soils comprise a wide range of coarse and fine-grained sandy to clay soils and formed through long periods of seasonal leaching on a maturely eroded topography.

The soils are usually dark grey to brown somewhat paler when cultivated depending on the content of organic matter. Subsoil texture characteristics become more clayey with increased depth. The soils range from strongly to slightly acid (pH 4.5 to 6.0) and medium fertility. Most notably, clayey vertisols are well developed in dambo areas such as the reed dambo in the headwaters of the Muswishi River. Greyed, leached dambo type soils also occur in various localities in which drainage is impeded causing seasonal waterlogging.

f. Hydrology

The major river draining Kabwe district is Mulungushi which also marks the boundary with Kapiri Mposhi district to the North. Other rivers are Chitakata, Kalonga and Munga.

Kabwe is situated east of the main water shed. The smaller western part drains towards the Lukanga Swamps whereas the remaining surface water flows towards the east into the catchment area of the Kafue river system. The Kalulu Forest Reserve contains the Kalulu well field. The drainage of the surface water directs towards the east like the rest of Kabwe area. However, the flow pattern of the surface water is not identical with the subsurface drainage system.

In addition to the natural drainage network, much of the runoff from the Kabwe mine complex, western townships of Kasanda and Makululu, and the eastern townships of Chowa and Katondo drain into a 9km canal system. This system discharges to the Muswishi River and ultimately the Lunsemfwa through a natural wetland to the south-east of Katondo. The main canal extends south-eastward from the mine to the reed dambo in the Muswishi River.

g. Geomorphology

The relief of Kabwe District is a gently undulating plateau dissected by dambos. The plateau can be described as generally gently rolling, interfluves crests that are usually flat (1 percent) while shoulders and middle slopes are convex with moderate slopes (1 to 3 percent). Kabwe district lies on the watershed between the Kafue and Lunsemfwa rivers which forms the Luangwa river basin on the Luano valley. The watershed approximately follows the line of the Great North Road from Lusaka to the Copperbelt (Clayton, 1980).

References:

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3.0 SOCIO ECONOMICS

3.1 Population

In 2000, Kabwe had a population of 178,341 distributed across its 26 wards and 2 constituencies (Tables 3.1 and 3.2) divided into 34,203 households and with the annual population growth rate of 0.5 percent. This was a progression from the 1990 figure of 169,026 (CSO, 2001).

Table 3.1: Population and Gender Desegregation for Kabwe Central Constituency

	Households	Males	Females	Total	% Males	% Females	Total
Kalonga	1,738	4,901	5,106	10,007	48.98	51.02	100
Mpima	1,122	3,086	3,092	6,178	49.95	50.05	100
Luangwa	3,209	8,248	9,524	17,772	46.41	53.59	100
Highridge	1,439	3,474	4,067	7,541	46.07	53.93	100
Justine Kabwe	846	2,357	2,675	5,032	46.84	53.16	100
David Ramushu	1,188	2,848	3,119	5,967	47.73	52.27	100
Njanji	860	2,276	2,756	5,132	46.29	53.71	100
Chirwa	3,900	8,296	9,691	17,987	46.12	53.88	100
Luansase	177	680	466	1,146	59.36	40.64	100
Nakoli	1,680	3,275	3,845	7,120	46.00	54.00	100
Kaputula	3,098	6,158	6,963	13,121	46.93	53.07	100
Waya	1,048	3,027	3,247	6,274	48.25	51.75	100
Total	**20,305**	**48,626**	**54,551**	**103,277**	**47.08**	**52.82**	**100**

Table 3.2: Population and Gender Desegregation for Bwacha Constituency

	Households	Males	Females	Total	% Males	% Females	Total
Chililalila	836	1,829	2,072	3,901	46.89	53.11	100
Moomba	1,985	3,977	4,497	8,474	46.93	53.07	100
Makululu	646	1,426	1,713	3,139	45.43	54.57	100
Ben Kafupi	1,012	2,436	2,688	5,124	47.54	52.46	100
Kawama	1,571	3,939	4,081	8,020	49.12	50.88	100
Munga	751	2,075	1,754	3,829	54.20	45.80	100
Munyama	892	2,153	2,306	4,459	48.29	51.71	100
Muwowo	1,161	3,516	3,015	6,531	53.84	46.16	100
Bwacha	1,579	4,106	4,766	8,872	46.28	53.72	100
Chimanimani	869	2,066	2,466	4,532	45.59	54.41	100
Ngungu	1,282	3,330	3,846	7,176	46.41	53.59	100
Zambezi	1,704	3,657	4,236	7,893	46.33	53.67	100
Kang mba	663	1,551	1,564	3,115	49.80	50.20	100
Total	**14,951**	**36,061**	**39,004**	**75,065**	**51.96**	**51.96**	**100**

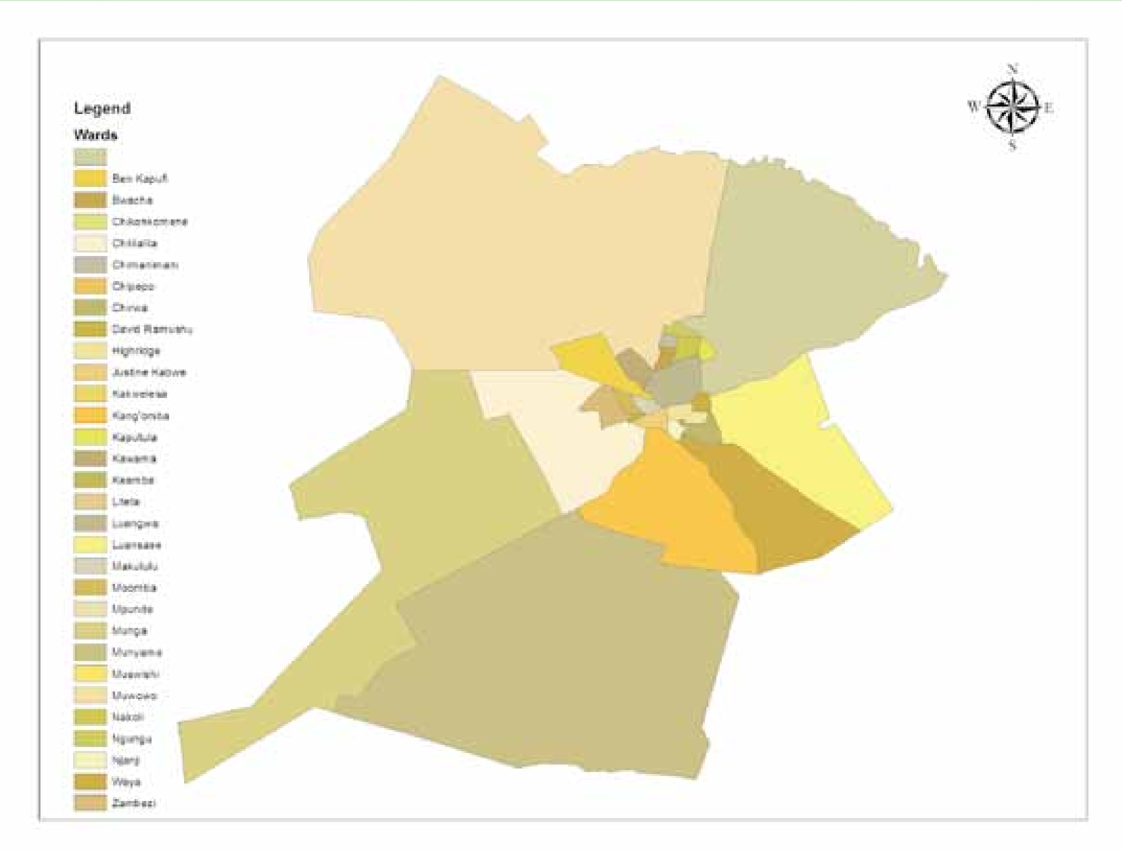

Figure 3.1 Kabwe District Wards (Source ECZ 2010)

Although the population of Kabwe has continued to steadily grow, the population growth rate has been on the decline from below 7 percent between 1969 and 1980 to 0.5 percent between 1990 and 2000 as shown in Figure 3.2

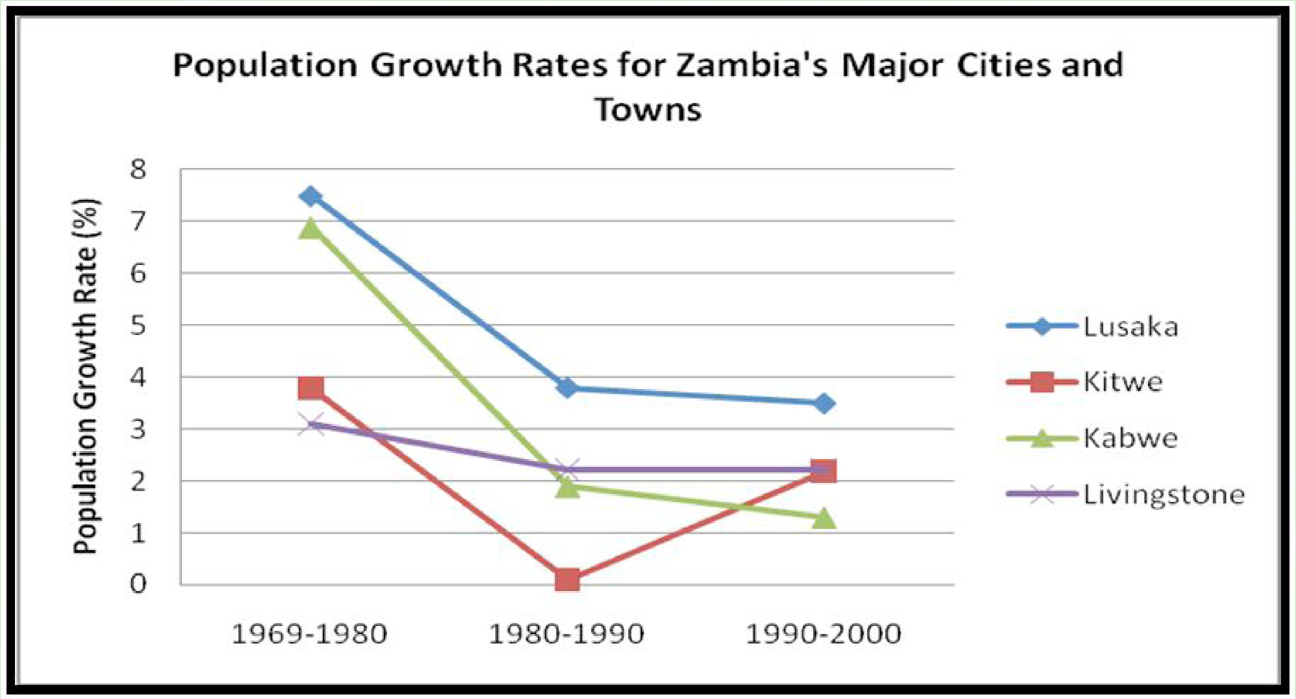

Figure 3.2: Population Growth Rates for Zambia's Major Cities and Towns

Factors responsible for this downward trend include general poor economic performance in the country which resulted in people moving from the cities to the rural areas. For Kabwe, the situation was exacerbated by closure of the mine, Zambia Railways and other supporting industries, which further slowed down the population growth. However, with the current positive growth in national economy and Kabwe in particular, the population of the district was projected to grow from 178,341 to 324,596 by 2010 as shown in Table 3.3.

Table 3.3: Projected Population 2010 for Kabwe District

Age Group	Male	Female	Total
0-4	18,043	17,688	35,731
5-9	16,162	15,864	32,026
10-14	11,985	12,257	24,242
15-19	12,631	12,746	25,377
20+	56,618	56,826	113,447
65+	2,201	1,572	3,773
Total	**117,640**	**116,956**	**324,596**

Source: CSO, 2000

3.2 Settlements

Kabwe's settlement pattern has a somewhat radial morphology, across both the south-north railway line and the Great North Road. Planned areas constitute the inner core areas around the Mine Area to the South, the central business district in the centre and the industrial complex to the north. The zone is immediately flanked by high cost residential areas (Luangwa and Highridge,) before getting to more remotely set medium cost areas (Pollen, Lukanga, Buyantashi) and low cost areas (Kasanda Mine Township, Bwacha, Chimanimani, and Ngungu and Railways compound). Planned areas are hemmed in by an outer ring of unplanned (Kamushanga, Abdul, Kakumbi, North East of town and Shamabanse Kawama Olotala and Zambani to the North West) and often unauthorised settlements and site and service schemes (Mukobeko, Katondo Natuseko).Table 3.4 presents unplanned settlements and conventional housing in Kabwe**.**

Settlement patterns and social services provision are aspects affected by population growth. In Kabwe, the highest population is concentrated in the peri-urban areas, which has led to limited access to provision of basic services such as water and sanitation, waste management, education and health facilities.

3.3 Industry and Infrastructure Development

Kabwe was once a leading lead and zinc mining town. Lead and zinc mining started in 1904 and ended in 1994 when the mines were shut down. This resulted in approximately 1,200 mine employees losing their jobs and an additional loss of about 5,000 jobs by contractors supplying goods and services to the mine. It was the major employer for Kabwe residents and nearly all other economic activities in the town were mining related. Other key activities included the Mulungushi Textiles and Zambia Railways whose headquarters was based in Kabwe. The closure of Zambia-China Mulungushi Textiles and the mines and concessioning of Zambia Railways rendered a lot of residents unemployed.

Table 3.4: Unplanned Settlements and Conventional Housing

No	Name	Cat	Estimated Housing Units	Estimated Pop Density	Estimated Pop Density	Legal Status
			2000		2009	
1	Makululu	P	6,641	46,487	50,339	NG
2	Katondo	P	5182	31,092	33,668	NG
3	Nakoli	P	1,521	8,000	8,527	NG
4	Shamabanse	P	600	7,000	7,461	G
5	Kawama	P	666	3996	4,327	G
6	Kaputula/Natuseko	P	1,152	6,912	7,485	NG
7	Kamushanga	P	600+	4,000	4,331	G
8	Wire (Waya)	P	600	3600	3,868	NG
9	Abdul C Gate	P	300	1,500	1,586	NG
10	Kakumbi	P	160	1,280	1,375	NG
11	Makwati	P	138	500	541	NG
12	Maipambe	P	230	1,380	1,494	G
13	Olotala	P	600	3,600	3,898	G
14	Town Centre	H	295	1,770	1,902	G
15	Luangwa	H	463	2,778	2,937	G
16	Dallas	H	125	750	793	G
17	Highridge/Kasakwa	H	772	4,632	4,859	G
18	Nkrumah	H	80+-	480	528	G
19	Kabwe Mulonga	M	4	24	25	G
20	Railways Chirwa	M	900	5,400	5,665	G
21	Pollen	M	555	3,330	3,521	G
22	Chowa	M	666	3,996	4,192	G
23	Mwalala	M	51	306	324	G
24	Kasanda Mine	L	520	3,120	3,321	G
25	Lukanga	L	1130+-	6,780	7,226	G
26	Mukobeko	L	396	2,376	2,532	G
27	New Ngungu	L	355	2,142	2,283	G
28	Old Ngungu	L	576	3,456	3,683	G
29	Mulungushi Dam	L	14	84	89	G
30	Katondo Site & Service	L	561	4,000	4,263	G
31	Natuseko Site & Service	L	450+-	2,000	2,132	G
32	Bwacha	L	1,331	7,986	8,444	G
33	Chimanimani	L	610	3,660	3,870	G
34	Hostels	L	13	78	82	G
35	Single Quarters	L	140	840	939	G
Total			**28,397**	**179,335**	**192,472**	

Source: GKW Consult, (Key : H=High Cost, M=Medium Cost, L= Low Cost, P = Peri-Urban, G = Gazetted, NG = Not gazetted

The opening of Sable Zinc processing plant in the Mine Plant in 2000 led to the employment of 150 workers mostly, former miners (ZCCM-IH, 2005). Further mine allied companies namely Fine Steel, Zalco, Chiman Manufacturing Ltd, Ferro-alloy and Super Deal were opened near the Mine Plant in subsequent years and employed more people, mitigating unemployment levels. Other small mining activities are also coming up within the district. Other industries offering employment include Kabwe Industrial Fabrics Company (KIFCO), Railway Systems of Zambia and Dunavant. The commercial and tourism sectors are equally active and employ a good number of people in wholesale and retail shops, financial and hospitality operations.

3.4 Roads Infrastructure and Transport

In total, the district has more than 600km road network of which 90 percent are gravel and earth roads which require regular maintenance. Most of the roads have not been maintained except for those leading to economically important areas like Mukonchi and Munyama farming blocks, and fishing areas such as Mita Hills, Lukanga swamps and Kafue River. Table 3.5 shows an inventory of some roads in the district and their status.

The main modes of public transport are commuter buses and taxis which service commercial, industrial and residential areas. However, there are inadequate bus shelters and where they exist, they have been vandalised. Lack of bus stops in some areas has caused accidents as bus operators have no option but to stop on the road.

The other means of transport in the district is rail, which offers passenger and goods transportation services. The railway line passes through the district from the southern part of the country to the north and mostly carries bulky cargo. The district hosts the Zambia Railways National Headquarters whose operations have been concessioned to the Railway Systems of Zambia (RSZ). The railway network system extends southwards to Lusaka, Southern Province, Zimbabwe and South Africa; northwards to the Copperbelt and Democratic Republic of Congo; Northern Province and Tanzania.

Table 3.5: Inventory of Roads under the Supervision of the Roads Department

Road No/Name	Length (KM)	Condition	Bridge	Comments
T2 Great North Road	40	The stretch to Lusaka Kapiri Mposhi is good.	Mulungushi	A lot of opportunities exist since this is an international route. The road was rehabilitated.
D191 T – 2 Kasavasa	57.6	This road is in a fair condition because it was graded during the first phase of HIPC programme. However some stretches require rehabilitation to make it passable during the rainy season.	Momboshi	Used mostly by farmers for transportation of farm inputs and produce.
D 194 Makululu – Lukanga Swamps	30	Due to lack of maintenance over the past few years, the road has deteriorated and has gullies, potholes and depressions including the general loss of shape.	Nil	The road leads to fishing areas on the Lukanga swamps. Its condition has constrained the transportation of fish to markets in town.
D 195 Kasanda Grounds- Mukobeko prison	16.6	The road is in good condition.	Nil	Road rehabilitation was undertaken.
D 196 kabwe – Natuseko	6.8	Due to lack of attention over the years the road has become very bad.	Nil	Very few vehicles using the road due to its bad condition.
D197 Kabwe G. Hospital Bwacha Township	1.6	The road was graded, there was some improvement	Nil	With the slight improvement, traffic increased because it is the shortest route to the hospital from Bwacha Chimanimani and Ngungu townships.
D 200 Kabwe – Mukonchi	40	This road was recently worked on by a contractor and it is in good condition	Mulungushi	There is need for periodic maintenance of the road.
D 421 Kabwe Mulungushi Dam	53.9	The road is in bad condition.	nil	The is need for periodic maintenance
D 623 from D195-D196	12.1	Though it is in a fair condition, it still requires some attention	Nil	This road serves the farming community and needs maintenance

Source: KMC, 2010

In addition, the district has a local railway network that connects to the industrial area and mine plant. Currently, only the railway line to the mine plant is operational. Revamping railway operations to the industrial area would contribute to reduced transportation costs for the industries.

3.5 Access to basic social services

3.5.1 Education

Educational institutions comprising primary and secondary schools as well as higher learning Institutions such as Kabwe School of Nursing, Kabwe Trades Training Institute, Mulungushi University, Nkrumah College of Education, Immaculata Visitation College, Kabwe Skills Training institute and Paglory Teachers Training School play an important role in the provision of education and entrepreneur skills training.

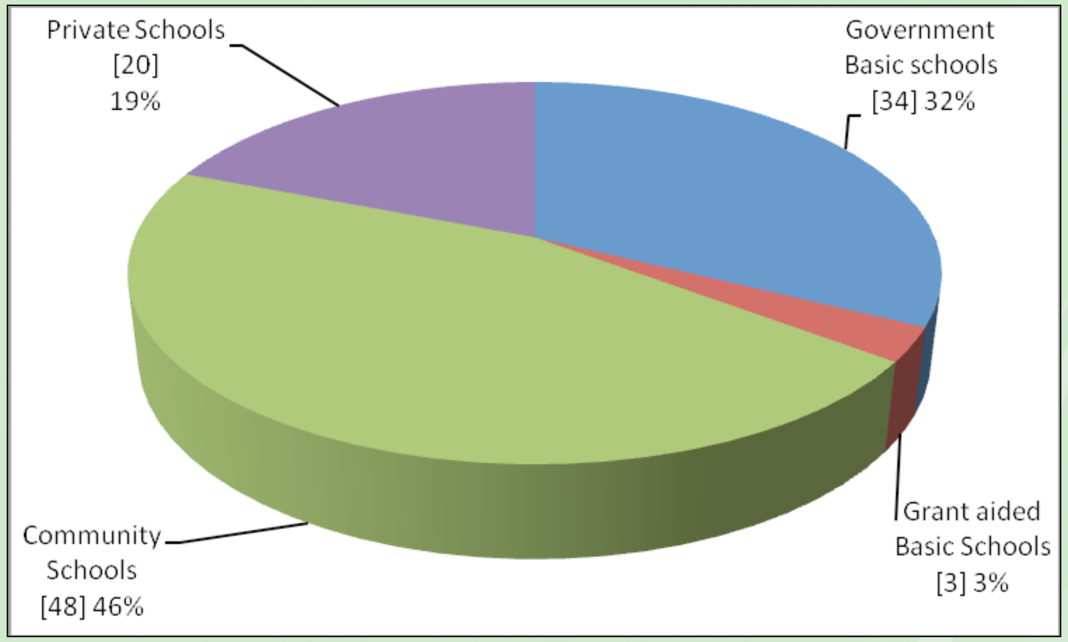

Figure 3.3 Basic Schools by category

Source: MoE, 2009

3.5.1.1 Basic School Level

Kabwe district has over 100 basic schools of different categories as indicated in Figure 3.3

Since the introduction of the Free Basic Education Policy, the enrolment of children has increased tremendously and this required corresponding increase in the number of classroom space. At the basic school level, there are currently 746 Classrooms against the pupil population of 49,508 and a teacher population of 1,721 as tabulated in Table 3.6.

TABLE 3.6 Number of Pupil, Teacher and Classes by category of School

No	Category of School	No of pupils	No of teachers	No of classes
1	Basic	37,292	1,335	453
2	Community	9,331	239	134
3	Private	2,885	147	159
	TOTALS	**49,508**	**1,721**	**746**

Source: MoE, 2009.

The pupil/teacher ratio and pupil/classroom ratio by category of school as shown table 3.7;

TABLE 3.7 Pupil/teacher ratio and Pupil/Classroom ratio by category of School

No	Category of School	Pupil/teacher ratio	Pupil/Classroom ratio
1	Basic	1 : 28	1 : 82
2	Community	1 : 39	1 : 70
3	Private	1 : 20	1 : 18

Source: MoE, 2009.

The pupil/class ratios for government basic schools and community schools are very high indicating overcrowding in classrooms which compromises quality. The few number of classrooms has resulted in schools conducting triple sessions hence reducing the teacher/pupil contact hours.

3.5.1.2 HIGH SCHOOL LEVEL

Access at high school level has not progressed at the same pace as at the basic school. The infrastructure development at this level has stagnated for a long time and this has had a negative effect on access to higher education. While 31 lower basic schools were upgraded to upper basic, only two (2) government schools were upgraded to high schools and two (2) grant aided schools upgraded to high schools as of 2009. This scenario has led to inadequate space at the high school to absorb the children progressing to higher grades. Currently the number of High schools by category, enrolment, teachers and classrooms are shown in Table 3.8.

TABLE 3.8 Number of Pupil, Teacher and Classes by category of High School

No	Category of School	No of High Schools	No of pupils	No of teachers	No of classes
1	GRZ High Schools	8	6,740	406	160
2	Grant Aided High Schools	3	1,647	94	48
3	Private High Schools	1	217	9	4
	TOTALS	**12**	**8,604**	**509**	**212**

Source: MoE, 2009

The Ministry of Education (MoE) has been developing specific interventions and explicit strategies that support the participation of the disadvantaged groups in the education process. These disadvantaged children, particularly, orphans and vulnerable children (OVC), girls and children with special education needs are specifically targeted to allow them to equitably benefit from opportunities that are provided in the education system. The MoE is working in conjunction with the Department of Social Welfare in identifying orphans and vulnerable children to benefit from bursary schemes.

OVCs being screened at the Department of Social Welfare

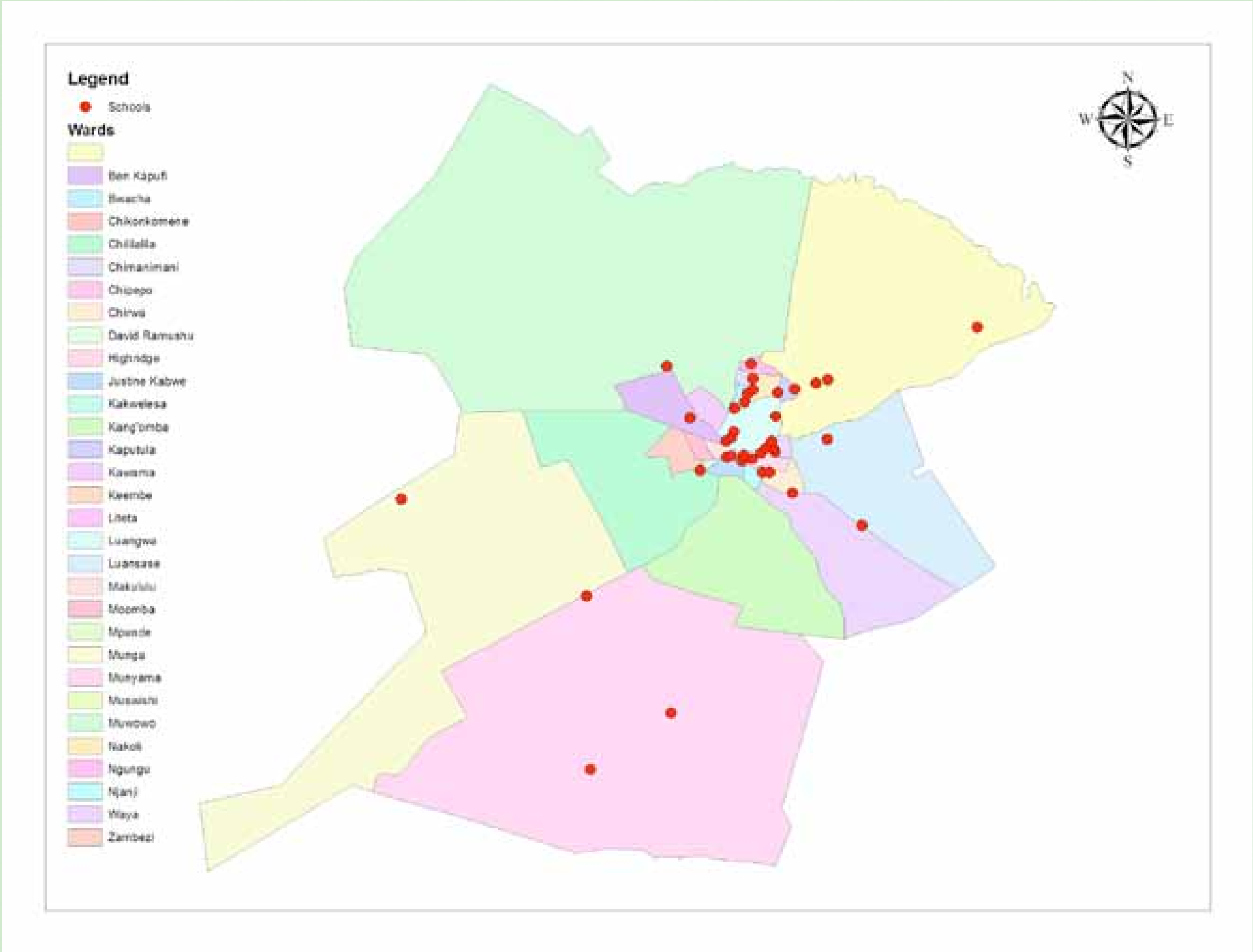

Figure 3.4: Distribution of schools in Kabwe District

Note that schools are concentrated around the wards in the Kabwe urban area where there is high population density as illustrated in Figure 3.4

3.5.1.3 TERTIARY LEVEL

The district has the following higher institutions of learning indicated in Table 3.9 by category and running agency.

TABLE 3.9: Institutions of Higher Learning by Category and Running Agency

No	Category of Institution	No of Govt Institution	No of Private Institutions	Total
1	Teacher colleges	1	2	3
2	Defence training colleges	2	0	2
3	School of Nursing	1	1	2
4	Skills training centres	2	0	2
5	University	1	0	1
	Total	**7**	**3**	**10**

Source: MOE 2009

3.5.2 Healthcare Facilities

Despite Kabwe being urban, the district has no district hospital for first level services. However, some facilities provide some first level services but other severe cases are referred to the provincial hospital (Kabwe General Hospital) for first level hospital services. It has a total number of Thirty (30) health facilities that include (17) health centres run by the Ministry of Health, Four (4) by the Ministry of Defence and Security, Four (4) by the Ministry of Home Affairs and Six (6) by private individuals/ organizations. Out of these Thirty health facilities, there are Three (3) functioning health facilities in peri-urban areas and One (1) which is still under construction, Six (6) delivery centres, Eight (8) providing ART services, Twelve (12) providing Laboratory services, while the provision of CT and PMTCT services are offered in all health facilities except OPD 1.

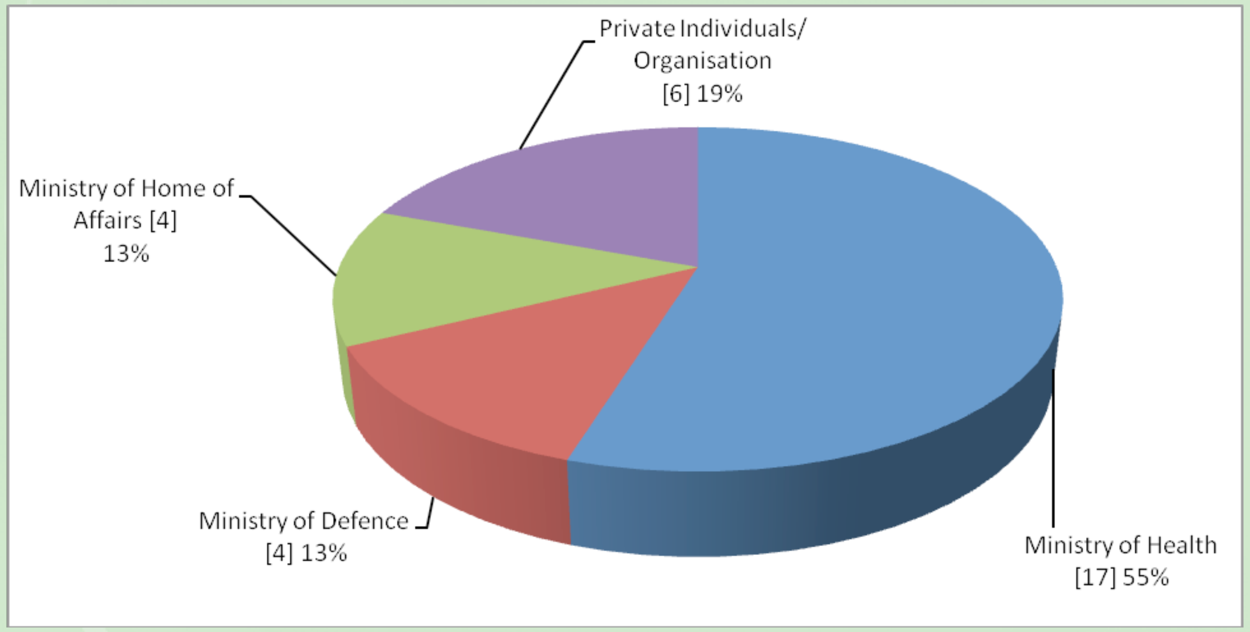

Figure 3.5: Institutions and Percentage of Health Centres in Kabwe
Source: MoH, 2010

Being a former lead mining town, with confirmed lead pollution, Kabwe district offers treatment to children with toxic blood lead levels at Two (2) health centres. Ngungu Health Centre was upgraded to a mini hospital with a total of 28 bed capacity. Figure 3.5 gives a summary of institutions offering health care services while Annex 2 provide details of services offered and the catchment area captured.

The district response to HIV/AIDS in Kabwe is monitored and evaluated through a decentralized framework. There are two important volunteer groups in the district that lead the monitoring and evaluation (M and E) process. The District AIDS Task Force, managed by the District AIDS Coordinating Advisor, and the Community AIDS Task Forces, besides coordinating local HIV-related initiatives, are responsible for collecting and submitting the NARF from all implementing sites in the district on a quarterly basis.[61]

Kabwe district had an estimated 2009 population of 176,758. HIV prevalence among adults 15 to 45 years of age is estimated to be 20.3 percent. This is more than Zambia's estimated HIV prevalence of 14.3percent for (12.3percent in men and 16.1percent in women).

District data on population, people living with HIV, and orphans and vulnerable children (OVC) in Table 3.10 are drawn from projections based on the 2000 Census. These are currently the only estimates available at the district level.

1

Table 3.10: Summary of Provincial and District Statistics, 2009

	Est. Population	Est. HIV Prevalence	Est. #PLWHA	PLWHA %female	Est. # OVC	% OVC single	% OVC double
Province	1,012,257	12.7%	84,993	52.8%	124,920	88.6%	11.4%
Kabwe	176,758	20.3%	24,244	52.2%	28,729	86.6%	13.4%

3.5.3 Employment Levels/Income Generating Activities

The transport sector represents the largest share of the job market followed by manufacturing in the district. This can be attributed to deliberate government policy from 1991-2001 which waived duty on imported vehicles intended for public transport. A small percentage of the population is employed as farm labourers in commercial farms.

In 2000, 63 percent of the population of Kabwe district was classified as being poor. The closure of the mines and major industries in Kabwe resulted in high levels of unemployment in the mid 1990's to early 2000 thereby causing high poverty levels. Therefore, people turned into various income raising ventures which include prostitution, alcohol brewing, trade and small scale entrepreneurship and scavenging on mine dumps to source scrap metals for resale.

Table 3.11: Food security Status during the 2003-2004 Season in Kabwe District

Camp	Status	Strategy
Chililalila	60% will have food up to next harvest. 40% do not have enough	-Chicken rearing, -Vegetable production - Trading, piece work
Kangomba	68% will have food up to next harvest season. 32% do not have enough	- Vegetable production - Chicken rearing - Trading
Kawaya	73% will have food up to next harvest season. 27% do not have enough	-Vegetable production - piece work
Mukobeko	70% have food up to next harvest. 30% do not have enough.	- Vegetable production - Trading
Munga	60% have food up to next harvest season. 40% do not have enough.	Off farm activities (Tuntemba)
Munyama	70% have food up to next harvest season. 30% do not have enough.	Off farm activities
Mpima	75% have food up to next harvest season. 25% do not have food.	-Vegetable production -Chicken rearing(local) - Fish mongering
Natuseko	60% have food up to next harvest season. 40% do not have enough.	-Chicken rearing (local) -Vegetable production
Seminary	70% have food up to next harvest season. 30% do not have enough.	-Vegetable production - Off farm activities
Waya	60% have food up to next harvest season. 40 % do not have enough.	-Vegetable production -Trading, chicken rearing -Piece work.

Source: Adapted, MACO-Kabwe, 2004

3.6: Food Security

Food security has improved in the last five years due to the Fertilizer and Input Support Programme (FISP) at household level with a few exceptional cases. Currently the stock for the entire district stored at the FRA is 69,410 x 50kg bags converting into 3,470 metric tonnes of maize in the 2008/09 season (FRA 2010). Table 3.11 gives an indicative picture of food security in Kabwe in the year 2003 - 2004.

It can be observed that on average 33 percent of households in the farming blocks identified in Table 3.11 , do not have sufficient food to last them to the next harvest season. This can be attributed to the fact that seasonality is a factor in food security and most of these farming communities depend on rain fed agriculture.

Vulnerable groups who are food insecure are targeted by government in the distribution of relief food and this helps to avert hunger even in times of poor crop productivity. However, the beneficiaries are few and the situation largely remains without mitigation.

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4.0 MINERAL RESOURCES

Kabwe district is rich in mineral resources such as lead and zinc. Major mineral discoveries were made in 1902 leading to the formation of Broken Hill Development Company in 1904 to exploit the resources. The mine was later taken over by Zambia Consolidated Copper Mines (ZCCM) until its closure in 1994 due to poor economic viability. Mine assets were sold to various companies and individuals while Government through ZCCM-IH took over the environmental liabilities.

The early mining methods from 1904 were of open cast type since the mineral deposits were found on the surface up to the depth of about 113 metres. A total of five open cast mines were sunk namely: No 1, 2, 3/4, 5/6, and E. Physical dimensions of the open casts are shown in Table 4.1.

Table 4.1: Open Cast workings Summary of physical Dimensions

Open Cast Mine Number	Maximum Depth m	Max Surface Breadth & Width	Surface Area m^2
1	113	240 x 100	26,390
2	45	140 x 110	10,280
3/4	20	110 x 67	5,025
5/6	55	250 x 90	20, 605
E	32	132 x 59	5,837
Total Surface Area			**68,138**

Source: ZCCM-IH, 1995

In 1940, underground mining commenced due to industrialization, high demand for lead and zinc metals, attractive world metal market prices and the need to exploit mineral resources to support the country's economy. A total of 12,116,000 tons of lead and zinc deposits had been discovered underground. The mineral content of the ore was in some cases as high as 34.7 percent zinc and 18.8 percent lead. This led to the expansion of surface metallurgical operations to increase metal output by the commissioning of the Imperial Smelting Furnace (ISF) in 1962 and the Waelz Kilns in 1975. Table 4.2 indicates the production of lead and Zinc metal from 1915 to 1994.

Table 4.2: Kabwe division Summary of Metal production

Years	Lead production Tons	Zinc Production Tons	Cadmium Kg	Silver Kg	Vanadium Pentoxide
1915-1944	119,696	178,939	-	-	74,419
1940-1969	383,714	861,631	888,261	48,418	-
1970-1994	315,125	809,641	-	63,552	-
Totals	**818,535**	**1,850,211**	**888,261**	**105,969**	**74,419**

Source: ZCCM-IH, 1995

According to the National Policy on Environment (NPE, 2007), Zambia faces a number of environmental problems arising from mining activities. Notable ones are; a) dereliction of land through erosion, toxic dumps, and redundant facilities; b) water pollution due to unmanaged waste water and sediment discharge; c) air pollution by dust and refining processes; and d) failure to restore mined and quarried land. Kabwe is not exempt to these issues as the oldest mining town in the country.

Kabwe's mining and mineral processing operations were undertaken during a period when statutory environmental controls within the mining sector were almost non-existent. During the later years of ZCCM operations, poor economic performance also undoubtedly inhibited environmental due diligence. Closure of the mine in 1994 consequently left a substantial legacy of environmental hazards some of which persist today.

4.1. Lead Contamination

Lead pollution has been identified as a major health hazard in Kabwe. The mine plant complex which covers an area of 50 hectares had been the centre of all metallurgical operations up to the mine closure in 1994 and is the main source of lead contamination deposited in the surrounding areas through stack and fugitive emissions. Other sources of contamination include the main mine waste dump located west of the mine plant area, Mulungushi Road Slag Dump located east of Chowa and the open pits.

The main mine waste dump occupies an area of approximately 100 hectares and is a home to a variety of mine and metallurgical waste products with a total tonnage of about 8 million (Table 4.3) with high percentage of heavy metals including lead (Table 4.4). The dump is a source of lead contaminated fugitive dust partly responsible for contamination of soils in areas west of the mine plant area. The dust poses both health hazards and public nuisance.

Table 4.3: Kabwe Mine Summary of material types in Waste Dumps Kabwe Mine

Waste type	Time of deposition	Base Area m^2	Volume m^3	Tons	Lead content Tons	Zinc content Tons
Leach residues	1926-onwards	385,500	2,69600	4,961,400	228,000	292,700
Sink/Float tails	Mar 1993	7,200	8,700	23,000	1,300	4,400
Washing Plant slimes	1953-Onwards	79,400	227,000	411,500	28,000	53,500
Pyrite tailings	1930-onwards	38,400	170,700	443,600	12,000	39,000
ISF Slag	1953-1962	61,400	588,200	723,500	11,000	60,100
Waelz Kiln Slag	1975-onwards	164,800	827,800	1,241.600	16,000	52,100
Other waste		11,800	93,300	169,900	6,800	16,800
Totals		721,500	4,611,100	7,975,300	304,000	519,500

Source: ZCCM-IH,1995

Table 4.4: Kabwe Mine Principal Metals in Waste Dump Material Type

Element Waste Type	Cadmium mg/Kg	Lead %	Zinc %	Copper %	Vanadium %
Leach Plant residue A	20	3.60	3.50	0.18	0.15
Leach plant residue B	40	3.90	4.40	0.16	0.38
Leach Plant residue C	45	5.50	8.30	.016	0.34
Sink float Tailings	51	1.80	8.00	0.02	0.21
Washing Plant Slimes D	140	6.80	13.00	0.10	0.15
Pyrite tailings	145	0.50	15.00mn	0.20	0.10
ISF	30	1.60	8.30	0.15	0.42
Waelz Kilns Slag	3.8	1.30	4.20	0.09	0.23
Mixed waste Pond	42	5.10	3.00	0.02	0.18
Mine waste rock	49	1.80	3.60	0.01	0.10

Source: ZCCM-IH,1995

The Mulungushi Road Slag Dump east of Chowa township had been a dumping place for miscellaneous waste material from the mine plant and was closed in the late 60s.The dump was originally a disused borrow pit covering an area of 2.5 hectares and 3 metres deep with an estimated 192,750 tonnes of mine waste at an average of 5.0 percent lead and 10.0 percent zinc.

The Canal Dredged material has been a source of lead contamination for Part of Chowa Township as well as for Katondo settlement for households in close proximity to the main canal which has lead material heaped along 5.5km of its 8.5km stretch. The dispersion of fine aggregate dredged material by wind and occasional flooding of the canal and the use of the Canal Zone as a playing ground by children in the local community poses great lead risk exposure.

A total of 32,000 tonnes of dredged material remained uncollected from the banks of banks of the canal at the closure of the mine in 1994 as waste heaps with metal content of 5 percent and 10 percent lead and zinc respectively. This contributed to the elevation of soil lead levels ranging from 1700 to 5000 ppm.

The contribution of open pits to lead contamination is due to the fact that Kabwe naturally has elevated levels of lead in the soil due to the rich mineral deposits. Excavations in the process of mining thus contributed to the spreading of lead contamination in the area through fugitive dust emissions and erosion.

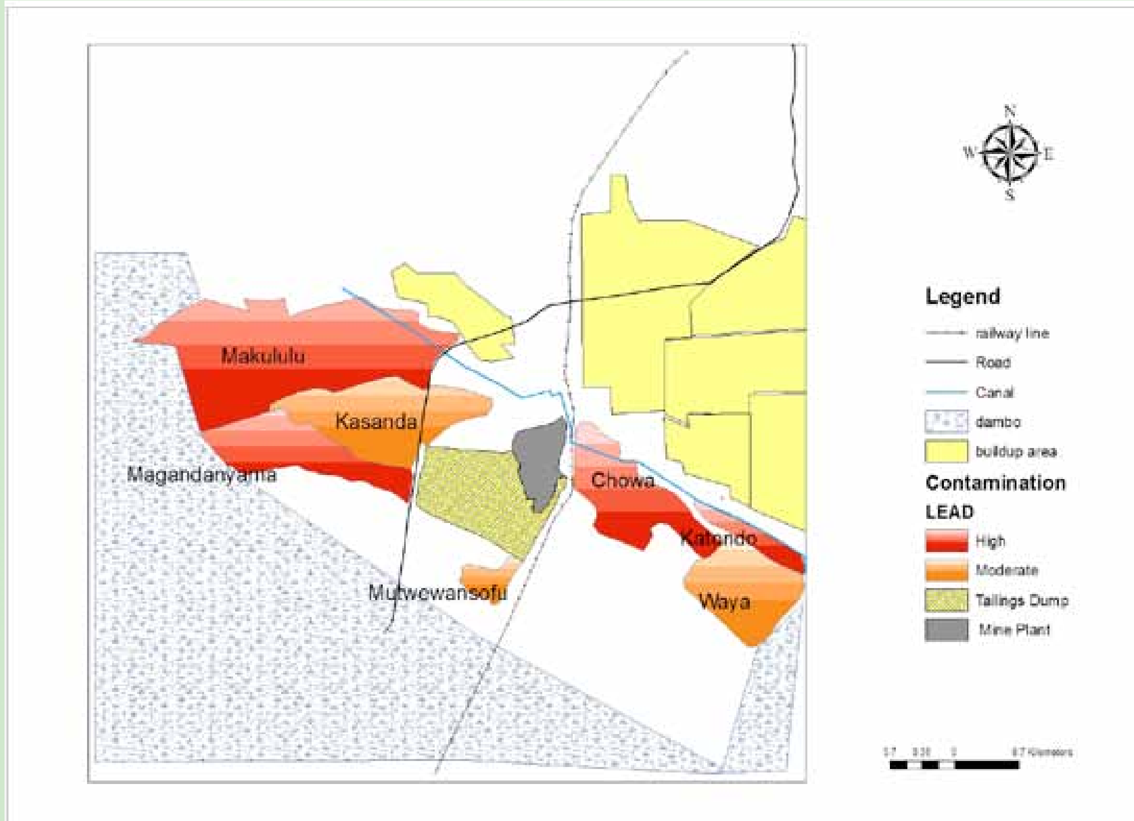

Figure 4.1: Lead contaminated Townships in Kabwe
Source:ZCCM-IH, 2006

Communities mainly affected by lead contamination are mostly former mine townships and surrounding communities including settlements along the main canal. These are; Kasanda, Makululu and Makandanyama on the western side, Chowa, Waya and Katondo (along the canal) on the eastern side and Mutwe wa Nsofu on the southern side of the mine plant area. The affected areas occupy a total of 1,228 hectares (0.24 % of total land area in Kabwe). The intensity of lead hazard sources is located and greatest in close proximity to Kabwe mine site and progressively declines with distance from the mine area. Poor vegetation cover results in a dusty environment especially in the dry season and also contributes to the spread of lead dust thereby increasing the risk of lead inhalation.

Table 4.5 presents a comparison of soil sampling at different depths for lead content in Kasanda townships in 1990 and 1995. The average lead levels in dust samples from inside homes in Kasanda Township as a result of dust fallout from stack emissions and from the Main Waste Dump was 3.2per cent.

Tables 4.5 and 4.6 and Figure 4.1 show levels of lead contamination at different locations within the mine plant site and Kasanda Township as per sampling conducted in June 1994 and between 1990 and 1995 respectively.

4.5: Mine Plant Soil Sampling between 26 to 28/06/94 for Lead Contamination

No	Location in Mine Plant	% Lead	No	Location in Mine Plant	% Lead
1	Main gate	0.9	20	Sinter Sub station	6.6
2	Safety office	1.2	21	ISF Mess Room	40.9
3	DMP Bin	13.7	22	Refinery- East	2.1
4	Mixed Fines Bin	2.9	23	Refinery South	2.9
5	ZMF Area	5.6	24	Refinery /OT	15.9
6	Rock Pile	4.7	25	Refinery/CT	8.2
7	Ore Shaft	2.8	26	ISF/PS	8.2
8	Oxide Cons Shed	9.0	27	HFO Tank	14.6
9	Salvage Yard	1.4	28	Waelz Kilns Offices	8.8
10	Salvage Yard Tank	4.4	29	Waelz Kilns 2	12.8
11	Winding Shop	13.8	30	Kiln 3 West	1.1
12	Simons crusher	7.1	31	Kiln 3 DH	1.8
13	Mine Stores	4.1	32	Blending Shed	1.8
14	Boiler Shop	1.9	33	Main Substation	1.0
15	Metal Sales	7.0	43	Workshop	9.6
16	Clinic	4.9	35	K3 CDR	2.3
17	Charge handling Station	4.1	36	Sinter West	7.8
18	Human Resources	15.3			
19	Sinter Main stack	1.9			

Source: ZCCM-IH, 1994

Table 4.6: Soil sampling for lead content in Kasanda Township 1990 and 1995

Pit Depth	0-5cm **(Surface)**		5-20 cm		20-35 cm		35-50 cm		50-100 cm	
Year	1990	1995	1990	1995	1990	1995	1990	1995	1990	1995
1	3.0	2.1	0.5	0.8	0.4	0.1	0.2	0.1	0.3	0.1
2	1.1	0.9	0.5	1.1	0.8	0.4	0.6	0.2	1.3	0.2
3	0.7	0.7	0.6	0.1	0.4	0.1	0.6	<0.1	0.2	0.1
4	1.1	0.4	0.3	0.5	0.6	0.1	0.2	0.2	0.2	0.2
5	0.9	1.1	0.9	0.9	0.2	0.5	0.2	0.2	0.2	0.2
6	3.8	0.8	0.9	0.1	0.1	0.2	0.2	0.2	0.8	0.1
7	1.0	0.6	0.9	0.1	0.8	0.1	0.9	0.1	0.6	0.1
9	1.2	0.8	1.8	1.2	0.3	0.4	0.3	0.1	0.3	< 0.1
11	1.0	0.4	0.8	0.1	0.7	0.6	1.5	0.2	0.8	0.1
12	1.2	0.6	0.1	1	0.4	0.2	0.6	0.1	0.4	0.1
13	0.9	1.4	0.8	0.1	0.3	<0.1	0.3	<0.1	0.3	<0.1
14	0.2	0.1	1.3	1.3	0.8	0.1	0.3	<0.1	0.3	<0.1
15	1.0	0.2	0.3	0.2	0.3	0.1	0.6	<0.1	0.3	<0.1
19	2.6	0.9	0.6	0.1	0.4	0.1	0.2	0.1	0.6	0.3
Mean	**1.4**	**0.8**	**0.7**	**0.5**	**0.5**	**0.2**	**0.5**	**0.1**	**0.5**	**0.1**

Source: ZCCM-IH Analtyical Reports 1995

One of the public health issues of concern associated with lead contamination is lead poisoning denoted by high blood lead levels in the population surrounding the polluted areas. Box 4.1 present results of a study conducted to establish the effects of lead contamination on blood levels in Kabwe residents living around contaminated areas.

Loose dust from mine waste dumps and emissions from mining and mineral processing operations are not only a nuisance causing discomfort but a health hazard too as they may cause chocking, coughs and other respiratory problems.

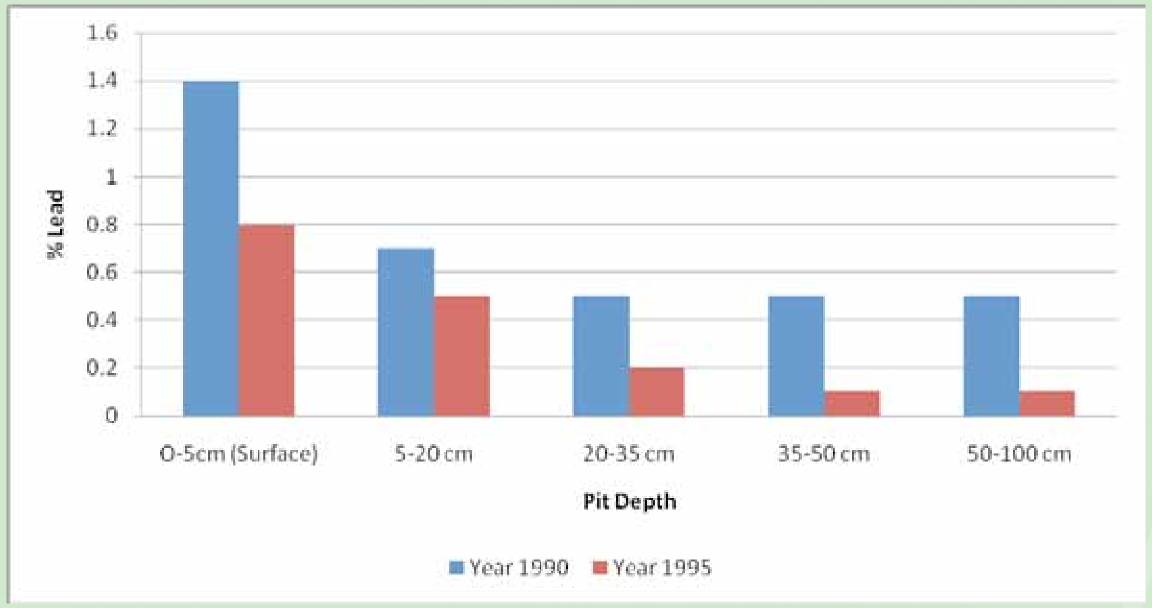

Figure 4.2: Lead Contamination at different soil depths in Kasanda Township

Box 4.1: Blood Lead Survey in Kabwe

Blood Pb is the most biomarker of Pb exposure. The central objective of the Pb survey performed under the Kabwe Scoping and Design Study (KSDS) was to derive spatial trends of Pb exposure and develop an understanding of the full range of controls on such trends.

The survey was conducted between September 2004 and May 2005.The objective was to define levels of human exposure to lead across Kabwe and ultimately to relate these to the patterns of environmental lead contamination recorded in soils and other media. The blood lead surveys were conducted concurrently with a social-demographic profiling exercise, so as to permit interpretation of inter and intra–community blood lead trends within the context of lifestyle and behavioral factors. Geometric mean values for blood lead levels in impacted townships and settlements ranged from 18-38 µg/ dl.

The World Health Organisation (WHO) specified a blood lead level of 40 µg/dl in the general population and 30 µg/dl in women of childbearing age. Subsequent WHO standard have been based on keeping levels in the vast majority of the population below 20 µg/dl.

A comparison of the Kabwe geometric mean values for blood lead levels in impacted townships and settlements was conducted. Blood Pb in individual townships and community cohorts showed an inverse correlation between human exposure and distance to the Kabwe mine site.

Findings indicated Pb exposure in localities such as Kasanda, Makandanyama, Mutwe wa Nsofu, Chowa, Makululu and Waya. Communities that were found to be broadly compliant with the 20 µg/dl threshold included Bwacha, Highridge, Kawama and Mukobeko

Source: ZCCM-IH, 2006

4.2. Land Degradation

Mineral exploitation in Kabwe has resulted in land degradation due to the presence of waste dumps and open pits which have excluded use of the affected areas for other useful purposes. Notable areas include Kasanda, Chowa and Katondo. In these areas, vegetation growth is poor and the growing of vegetables and other plants is affected. The presence of these dumps and open casts has also led to loss of aesthetic value of the area.

In addition, quarrying activities in response to demand by the construction industry has contributed to land degradation. Anthill excavation mainly for brick making is an emerging environmental concern in the district.

Unsecured open pits, dump sites and caving in areas pose health and safety hazards to members of the public in the area and are of significant concern.

Despite some of the negative impacts of mining in Kabwe, the opening of new mineral processing companies such as Sable Zinc, Fine Steel, ZALCO and Chiman Manufacturing Ltd have contributed to the economy of the district through employment creation and business opportunities.

To address environmental impacts arising from mining activities in Kabwe, some of the measures undertaken include:

(i) KMC has developed a 5 year District Development Plan (DDP) for the period 2006 to 2010 and has guided development in the district. A number of environmental interventions identified in the plan, were implemented under the Copperbelt Environment Project (CEP) through ZCCM-IH.

(ii) Interventions to address risks associated with mine waste liabilities, among them:

a. Mine Plant Rehabilitation
Demolition of all unusable structures and removal of rubble has been completed for all sites handed over to ZCCM-IH by some asset owners and for orphaned sites i.e. Former ISF/Sinter and Refinery. The area has been rehabilitated and covered with lead free soil.

b. Open Casts
All pits except for No. 2 Open Cast whose surface area is under license with Ringa Investments Ltd have been wall-fenced to prevent trespassing.

c. Kabwe Main Canal
Removal of 53,000 cubic metres of lead dumps has been completed to reduce lead sources from the canal zone. The material has been relocated to the wall-fenced caving/open cast area and monitoring of lead levels along the canal is being undertaken.

d. Mulungushi Road Slag Dump
The mine waste has been relocated to a safe wall-fenced caving/open cast area and the pit rehabilitated by back filling with lead free soil to reduce lead sources.

e. Removal of Mine Waste from Residential Areas
Mine waste which had been imported to beautify surroundings in residential areas of Chowa and Luangwa townships was removed from a total of 105 houses to reduce lead contamination.

f. Water supply
Water supply has been improved in lead contaminated areas through a project aimed at increasing water supply to enhance dust suppression and greening.

Source: ECZ, 2010

g. Risk Communication
Environmental Public Information Centres (EPICs) have been opened in Makululu, Kasanda and Katondo communities and at the town centre library to improve lead education. Community structures have been helpful in implementing lead sensitization programmes.

h. Integrated Case Management (ICM)
This constitutes, among other programmes, administration of lead chelating drugs, food supplements; lead in blood analysis and health talks.

i. Play parks
11 parks have been constructed to provide safe play areas for children. Five have been opened for public use. In addition, Clayton Park has been rehabilitated and handed over to KMC.

j. Kabwe Community Lead Management Committee (KCLMC)
This is a forum that has been established for relevant stakeholders in order to evaluate the progress and implementation of the Kabwe Lead Project.

k. Moringa Tree Planting
Women Aglow International, Kabwe Chapter, a faith-based organization is implementing a project, Moringa Tree Planting in Kasanda and Makululu settlements. The organisation is targeting the disadvantaged households by encouraging them to eat Moringa leaves and bi-products as food supplements because of high food nutrients.

Source: ECZ, 2010

It can thus be concluded that mining related activities may continue to take place in Kabwe into the foreseeable future on a decreasing level as the exploitable resource gradually diminish. However, the impacts of lead contamination are likely to reduce following mitigation measures being put in place.

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5.0 WATER AND SANITATION

Kabwe gets its water from both ground and surface water sources. The ground water comes from Makululu and Kalulu Well Field; and two boreholes within town serving Luangwa township. Makululu and the two boreholes were formerly owned and operated by ZCCM-Kabwe Division. Currently they owned and operated by Lukanga Water and Sewerage Company. Ground water has been utilised for municipal water supplies since the town's foundation.

Surface water is taken from Mulungushi Dam (Brunelli) some 20km from Kabwe's district centre. The district also has a number of streams and rivers which include Natuseko, Mulungushi, Matipa stream, Kabwe- Kalonga River. Others are Munga Stream, Chapya and Nabusanga streams and Muswishi River. Apart from rivers and streams, Kabwe has a number of dams which are registered with the water board, but only two dams have known capacities, namely, Mulungushi Dam (Brunelli) with a capacity of 13,000,000m^3 and Mutuwila with a capacity of 7,500,000m^3 . The former is used by LGWSC for water supply where as the later is used for irrigation by a private farmer. Other Dams are; Chibambi, Bwala, Chisimana, Devoshe Estates, Mpashi, Mphonya, Mukobela, Muswishi, Mukombwe and WS Lutledge.

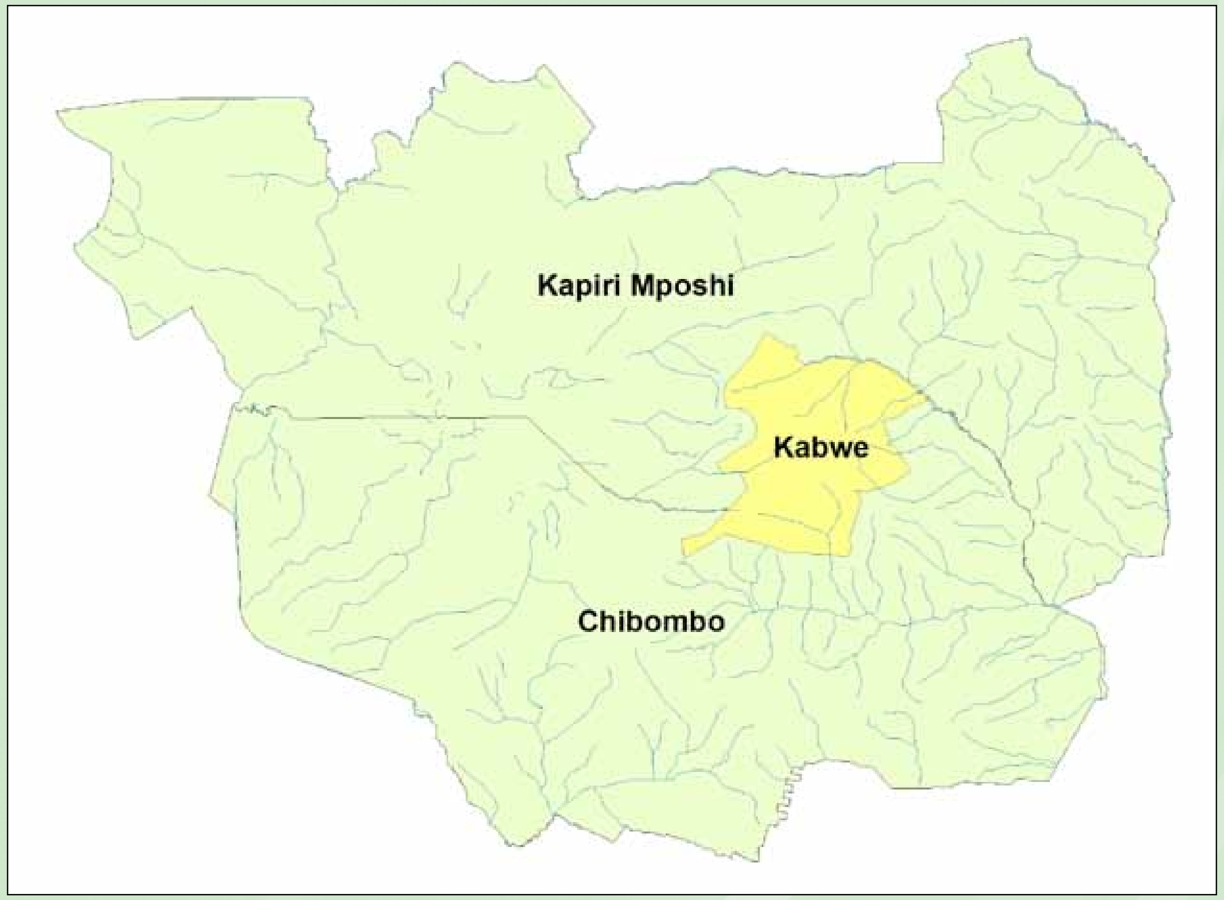

Figure 5.1: **Drainage map for Kabwe and neighboring districts**

In addition to these are dams owned by various farming communities like Dar- Farms, Deere Farms, Lilly Valley, Sam Isadore Estates, Mpima Dairy Scheme. These are used mainly for agricultural purposes.

5.1: Water Supply

Lukanga Water and Sewerage Company (LGWSC) is the main provider of water and sanitation services in the district. Initially these services were provided by KMC but were later transferred to LGWSC with the aim of increasing efficiency and sustainability in operation and customer services.

Table 5.1: Types of water supply within the townships

No.	Type of Connection	Number of connections	Expected population	% served
1	House/ Yard Connection	8,537	51,222	21.58
2	Communal Taps	22	11,000	4.64
3	Public Taps	126	22,680	9.56
4	Hand Pumps	*	2,700	1.14
5	Hand Dug Wells	*	104,699	44.12
6	Kiosks	30	45,000	18.96
	Total		237,301	100

Note: * number not known

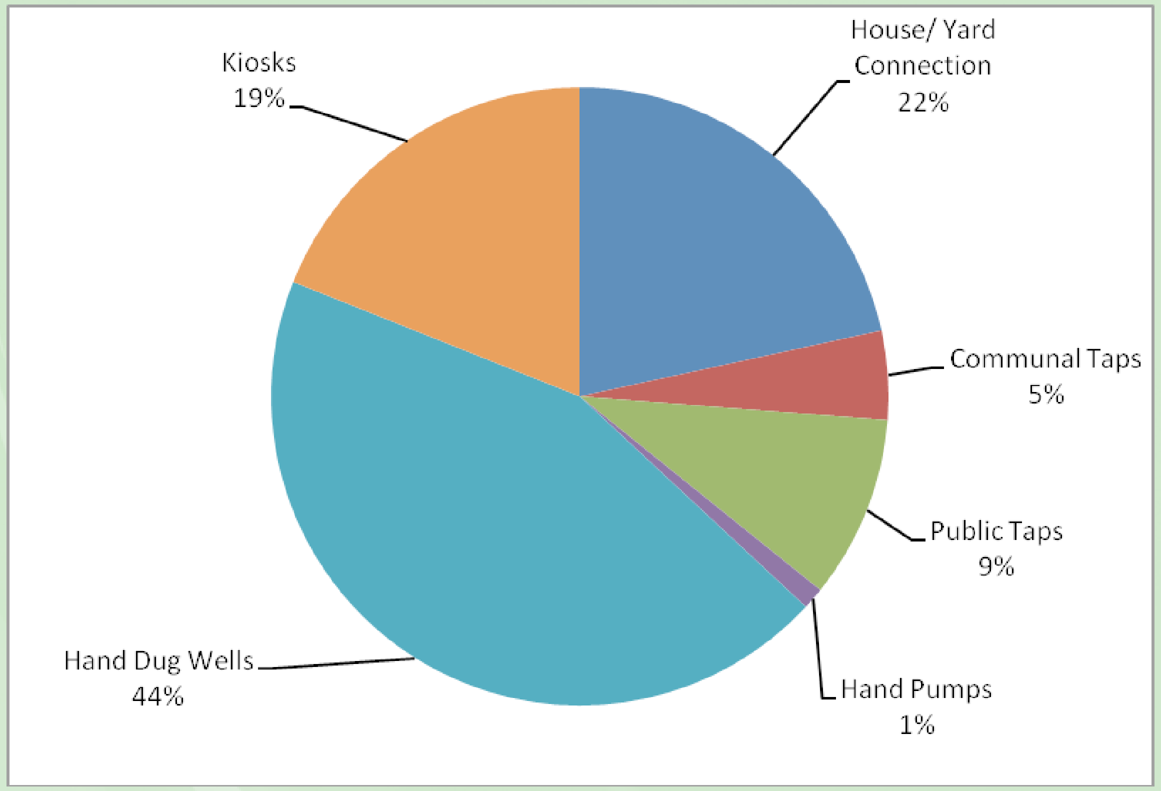

Figure 5.2: Percentage of Water Supply within the Township
Source: NWASCO, 2009

The status of water supply is as given in Table 5.1:

Note: The population shown as being served by hand dug wells is made up of those using hand dug wells and piped water provided by LGWSC through kiosks, public taps, communal taps and even yard connections. This is done due to limitations in access and the cost of piped water.

From Table 5.1, it is clear that there are variations in water supply within the district with 44 percent using hand dug wells. The implication of this, is that the majority of Kabwe residents do not have access to clean water and are thus at risk of being affected by water borne diseases such as cholera and other diarrhoeal diseases. Proliferation of unplanned settlements which are without water supply services has further exacerbated this problem.

There is however an improvement in the supply of clean water as noted in Table 5.2.

Table 5.2: Percentage of Population with Access to Water Supply

INDICATOR	2006	2007	2008
Water	%	%	%
% of population with access to safe water supply	49.60	55.60	65.40
% of population using other sources (shallow wells, streams, etc.)	50.40	44.40	34.60

Source: KDMO ,2009

Box 5.1: Water Supply in Kamuchanga

Kamuchanga is located 12 km north of the civic centre along the Ndola road behind Chindwin Barracks on the left hand side. It is a non-gazetted compound with a population of approximately 4,000,. Residents fetch water either at a communal hand pump, a public windlass well or at private yard wells.

According to the residents the supply situation is inadequate. The hand pump is managed by the community. The water quality is considered to be fair. The yard wells are generally in a poor condition and dry up in the dry season because the water table is low. The water quality at the wells is considered to be poor. Residents are convinced that the latrines pollute the yard wells. However, households do not treat the water used for drinking and/ or cooking.

Residents say that the biggest problems they have when it comes to water supply are: not enough water is available; the distance between the water sources and the dwellings is too far; and that people have to wait too long before they are able to fetch water. To improve the water supply situation they propose to extend the network to the area and to set up public taps and to improve sanitation.

Source: NWASCO, 2006

Between 2006 and 2008, there was a 15.8percent increase in the population with access to safe water supply. A reduction was recorded in the population using other sources of water such as wells and streams from 50.4 percent in 2006 to 34.6percent in 2008.

It can be noted from Table 5.2 that there is a steady increase in the number of people with access to safe water supply. This can be attributed to a number of interventions such as the Africa Development Bank (ADB) project which was initiated to revisit and improve water supply and sanitation service provision.

The interventions have resulted in improved service delivery in the district. There is improved coverage of drinking water due to new installations such as thirty (30) kiosks and 126 stand taps which have been installed in peri-urban areas. Further, LGWSC has also sunk 12 new boreholes which in addition to the 9 old boreholes gives a total of 21. The Highridge and Mukobeko pump stations have been rehabilitated.

Although the above interventions have been put in place to improve water supply, actual utilisation has been low due to costs and in some cases distance.

5.2: Sanitation

The municipality of Kabwe is served by a number of localized reticulated sewerage systems. The localized systems include three systems at Bwacha, two systems at Ngungu, and a system for the former mine townships at Kasanda and Chowa. The system draining town centre though separated into two is almost centralized and covers the industrial area in addition to all the residential areas within the periphery of town centre. It discharges its effluent to either Katondo or Natuseko ponds. The system in totality basically comprises all pipe sizes up to 600mm diameter. However, the district still has a number of settlements that are not connected to the sewerage network system.

Table 5.3: Percentage of Population with access to Sanitation

Sanitation	Year		
	2006	2007	2008
% of population using flush toilets	38.1	41.9	25.6
% of population using pit latrines	50	48.2	64.2
% of population using other forms of sanitation	11.9	9.9	10.2

Source: KDMO, 2009

Between 2006 and 2008, there was a reduction of 12.5percent of the population using flush toilets. This can be attributed to population increase in unplanned settlements without access to water and sanitation services.

To address improvement in sanitation provision, VIP latrines have been promoted in the peri urban areas within the district. Additionally, eco-sanitation is being implemented in Nakoli township fund by ADB through the Ministry of Local Government and Housing.

Box 5.2: Sanitation Situation in Nakoli Township

Nakoli is located 6km north-west of the town centre. It is bordered by the railway line in the west and the area mainly lies in a dambo. People depend on traditional pit latrines which are in a poor condition. Residents construct the latrines on anthills because the water table is high.

According to the Household (HH) sample, about 17% of the residents do not own/use any sanitation facility. They use empty Chibuku (opaque beer) packets or use toilets at public places (e.g. taverns). Reasons for not having a latrine are that people do not have enough space within their yard; the water table is too high and therefore people cannot dig deep enough and the pit fills up quickly.

Residents are aware that the latrines pollute their wells because of the high water table. Sharing toilets between neighbors is common. Latrines are constructed by household members or specialised latrine constructors. Residents complain that it is difficult to afford proper construction materials and to dig a latrine because of the high water table. Furthermore latrines are considered to be expensive and it is difficult to find a convenient site because plots are small. There are 28 public toilets found within the area which are in a poor condition.

Residents say the major problems they have when it comes to sanitation are that latrines overflow during the rainy season; they smell, quickly fill up and pollute the wells. The latrines also collapse frequently, and that frequent repairs are necessary. To improve the sanitation situation they would like to have VIPs constructed.

Source: NWASCO, 2006

5.3: Waste Management

The district generates various types of waste which include:-

1. Domestic waste which is generated as a result of daily activities in homes comprising paper, bottles, plastics and organic waste;
2. Commercial waste which is generated from commercial activities and other related premises;
3. Industrial waste which is generated from industries such as Mulungushi Textiles, KIFCO and Malar tannery;
4. Hazardous waste which is waste that is generated from mining operations and health care facilities.

Most of the waste is disposed of indiscriminately in pits, open areas and by burning. Consequently, this has contributed to a number of problems such as blocking of storm drains, resulting into floods and the stagnant water become breeding grounds for mosquitoes. Flooding in some areas such as Chowa has been attributed to refuse that had choked the drains and eventually the main canal.

Poor waste management also diminishes the aesthetic value of the surroundings. In unplanned settlements, refuse is washed into shallow wells during the rainy season and contaminates the water.

Burning of waste pollutes the air especially if refuse contains plastics and this causes chest and other respiratory infections.

Kabwe has one designated waste disposal site located near Mukobeko Township. However, there are no management interventions at the site as evidenced from uncontrolled dumping of waste, lack of signage and security. The site was opened after closure of the Mpima disposal site in order to improve waste management by the local authority. In line with the national programme Make Zambia Clean and Healthy Campaign, two light trucks and a tractor were provided to improve waste management in the two constituencies of the district.

The Council collects approximately 132 tonnes of waste per week from the town centre and markets managed by the Council. Waste generated from industries and residential areas is disposed off by the owners.

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6.0 LAND

Population growth and migration are the key drivers affecting land use planning in Kabwe. Industrial development is another driver but to a much lesser extent.

6.1 Land Tenure

All land in Zambia is vested in the President of the Republic of Zambia as enshrined in the Land Act of 1995. From a historical perspective, Zambia inherited a system of land tenure based on two principles namely Customary Land and Leasehold (State land) Land Tenure systems.

The customary land tenure system is traditional and its management and administration is based on customary practices. The underlying principle of the system is that land is held in common ownership by the community in perpetuity. Therefore, land is transferable following family/community traits but cannot be sold. This form of land tenure does not obtain in the district (Kabwe DSA, 2003).

All land in the district falls under leasehold (state land) tenure category which, according to the Land Act of 1995 provides for three types of leases as follows:

a. **Fourteen (14) Year Leasehold:** This is given to un-surveyed land and must be renewed at the expiration of the period;
b. **Occupancy Certificate:** a type of leasehold which gives the developer temporary access and user right for 30 years and applies to statutory housing improvement areas;
c. **Ninety-nine (99) Year Leasehold:** where title to land is given to the applicant for a period not exceeding 99 years after which the lessee has to apply for renewal of the title.

The 14 and 99 year leaseholds upon registration at the Lands and Deeds Registry are issued a certificate of title which is evidence of the holding by an individual, of the piece of land described in the certificate. This certificate can be used as collateral when acquiring a loan from lending institutions. Title to land can be obtained from the Ministry of Lands after recommendation from the Council.

Application for land ownership under leasehold is made to the Commissioner of Lands through the Local Authority who act as agents. Land owned under customary tenure can also be changed to leasehold with the consent of the traditional authority following the same process.

6.2 Land Use

The main land use types found in Kabwe are residential, industrial, commercial, agriculture, forest and water as shown in Figure 6.1

The Kabwe District Development Plan of 2006 provides a detailed assessment of land use in Kabwe. However, land use planning in line with the categorization in Figure 6.1 has not been easy and areas with mixed land uses are common.

Planned areas constitute the inner core areas around the mine area to the South, Central Business District (CBD) and the industrial complex to the north. The zone is immediately flanked by high cost residential areas (Luangwa, Town Centre, Highridge, and Railways) before getting to more remotely set medium cost areas (Pollen, Lukanga, Buyantashi) and low cost areas (Kasanda Mine Township, Bwacha, Chimanimani and Ngungu). Planned areas are hemmed in by an outer ring of unplanned settlements (Kamushanga, Abdul, Kakumbi, north east of town and Shamabanse, Kawama, Wolotala and Zambani to the north-west and site and service schemes (Mukobeko, Katondo and Natuseko).

According to the existing land development plan, the total land available for development in Kabwe is approximately 1,372 ha. The undeveloped residential land is split into the different housing categories as indicated in Table 6.1.

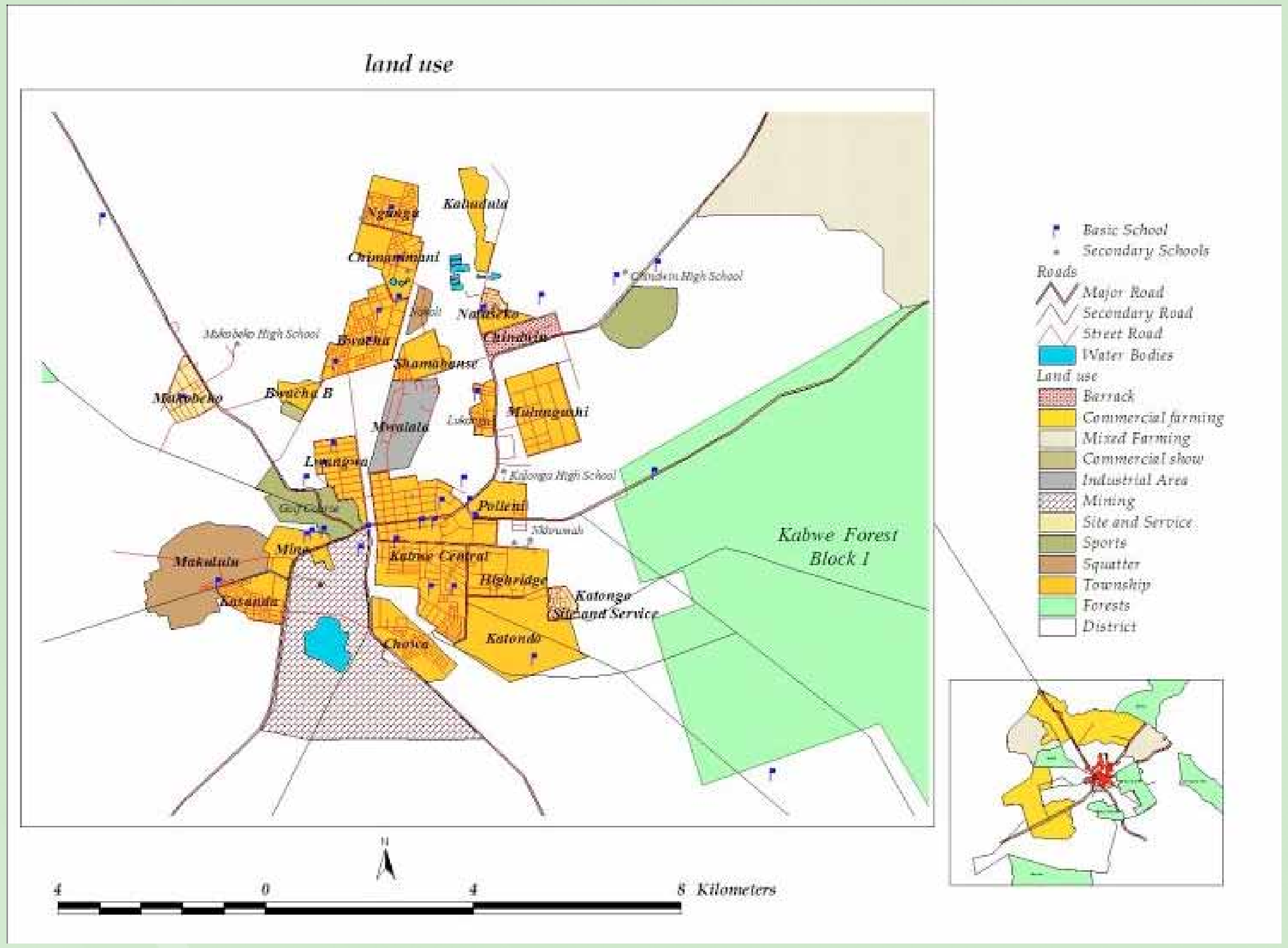

Figure 6.1: Land Uses in Kabwe

Table 6.1: Undeveloped Land for Residential Use

High Cost Ha	Medium Cost Ha	Low Cost Ha	Peri-Urban Ha	Total
224,38	57.62	73.20	1,016.79	1,371.99

Source: DSA, 2003

However, between 2007 and 2009, a total of 1,022 plots were availed for development (KMC 2009). Most of the land in Kabwe is used for residential, agriculture, industrial, commercial and forestry.

6.2.1: Agriculture

The district is demarcated into Four (4) agricultural blocks namely Munga, Munyama, Mpima and Waya. Each of these agricultural blocks is subdivided into agricultural camps which sum up to 14 camps. Table 6.2 presents block and camp compositions.

Table 6.2: Agricultural Blocks and Camps

BLOCK	CAMP			
Munga	Chililalila	Mukobeko	Munga	Kawama
Mpima	Mpima	Seminary		
Waya	Kangomba	Waya	Kafulamase	Natuseko
Munyama	Munyama	Kalwelwe	Musebo	Kawaya

Source: Adapted from MACO 2010

The predominant form of agriculture in Kabwe is rain-fed. Although there is modernization of agricultural methods, traditional production methods still exist, especially between small and medium scale farmers. There is low crop diversification and productivity with the exception of commercial farmers. The larger population still practices farming systems tied to the traditional structures and systems e.g. shifting cultivation, hand hoe and ox-drawn ploughs.

Table 6.3 shows the type of crops cultivated in Kabwe and the annual productivity for each category for the 2007/2008 season and Table 6.4 shows commodity average prices for April- June 2009.

Between 2006 and 2009, the district recorded a rise in crop production. In particular, production of maize increased as shown in Figure 6.2.

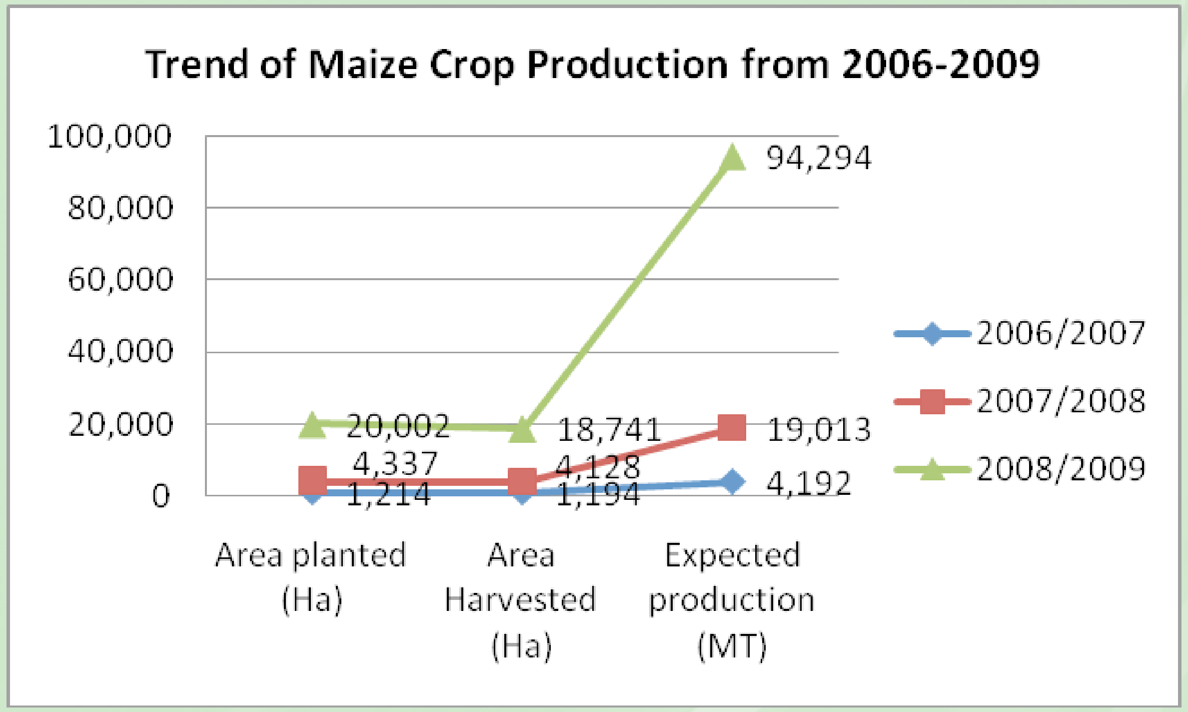

Figure 6.2: Maize production trend from 2006-2009
Source MACO/CSO Kabwe District (Year).

Table 6.3: Kabwe District Production figures for 2007/08 Farming Season

Crop	Maize	Wheat	Soya beans	Ground nuts	Sun flower	Seed Cotton	Sorghum	Rice	Irish Potatoes	Burly tobacco	Virginia tobacco	Mixed beans	Cow peas	Sweet potatoes	Paprika
Area planted (ha)	5,908	1,580	2,025	196	153	66	14	6	17	4	177	98	14	209	2
Area harvested (tm)	5,352	1,580	2,025	193	153	66	14	6	17	4	177	98	14	209	2
Expected production (tm)	19,725	8,358	5,353	146	182	329	8	5	439	7	376	48	7	702	2
Expected sales (tm)	15036	8,077	5,228	85	176	38	2	1	335	7	371	18	5	267	2

Source: MACO, CSO, 2008 (Annual Crop Focus Report)

Table 6.4: Commodity Average Prices for April- June 2009

COMMODITY		Maize Grain	Beans	Rice	Groundnuts Shelled	Mixed beans	Tomato	Cabbage	Breakfast Meal	Roller Meal
UNITY MEASURE		1kg	Meda (5Kg)	5kg	5kg	Meda (5Kg)	Box	Head	25Kg	25Kg
MONTHLY PRICES (ZK)	April	1,800	26,000	28,000	26,000	30,000	95,000	2,000	62,000	58,000
	May	1,800	28,000	35,000	28,000	25,000	100,000	2,000	69,000	60,000
	June	2,000	30,000	38,000	28,000	24,000	95,000	2,000	55,000	33,500

Source: Adapted from National Agriculture Strategic Plan 2006-2010
(Verify source and use correct citation)

There are 340 registered cooperatives in Kabwe district as well as some out grower schemes in cotton, paprika and tobacco. The companies involved in out grower schemes are, Dunavant which deals in cotton, Zambia National Farmers Union (ZNFU) and Cheetah Zambia in paprika and Central Growers Association in Tobacco.

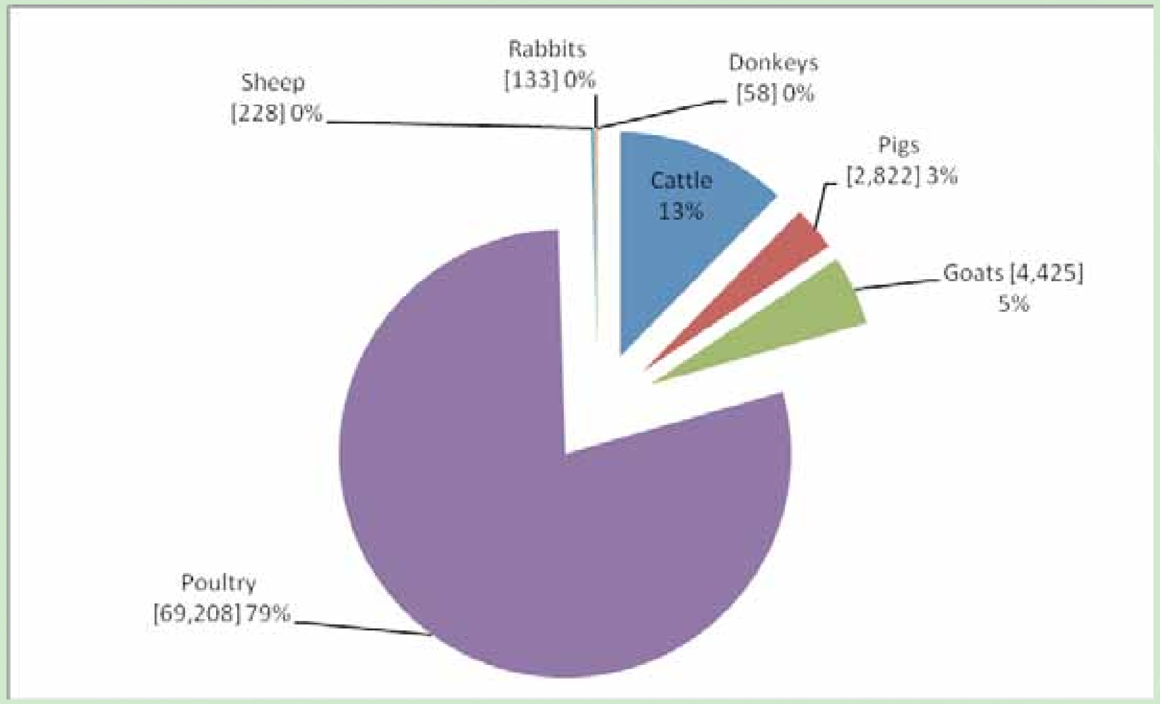

Figure 6.3: Livestock Production in Kabwe District
Source: MACO/CSO Kabwe District (2007/08)

ZNFU Kabwe office services 370 farmers within and outside the district and it has 13 information centers namely, Chikonkomene, Kasosoloko, Chowa, Kabanga, Katuba, Mulungushi–Agro, Munema, Mukobeko, Kato, Cha cha, Muswishi, Natuseko and Makupu. Apart from providing information to farmers, ZNFU trains farmers in agribusiness.

Livestock is integrated in the production system and according to the 2007/08 livestock census; the distribution in the district is as shown in Figure 6.3. Poultry accounted for the highest amount at 69,206.

The major constraints in relation to livestock rearing include;

- animal diseases;
- inadequate know-how on breeding;
- animal care, quality control and services;
- peripheral location and dispersed settlement patterns which hamper support services to reach individual farmers effectively.

To support animal production in the district, there are three communal dip tanks located in Mpima camp, Kafulamase and Waya to mitigate diseases.

Additionally, fish farming is an off-farm activity that is being promoted and carried out in the district. The number of small scale fish ponds is 42 with an average of 3,000tonnes of catches per annum. Inadequate incentives and lack of government and private sector support for inland fishery development and the absence of large rivers and lakes have hampered development of the sector in the district. There are also four communal dams in Mpima camp, Seminary, Kalwelwe and Munyama camps for the locals who want to engage in fish farming.

Other agricultural provisions available in the district include storage facilities and crop marketing services through the Food Reserve Agency (FRA). The district has several storage facilities that are currently under utilized due to low productivity. The Natuseko silos are idling while the sheds are now being used by Dunavant Cotton Company. The storage shed in Mpima has become seasonal just for the period of input distribution. The Kasavasa Slabs and Sheds are also facilities that are seasonally utilized. MACO encourages on-farm storage where storage bins such as burnt brick bins, cement plastered baskets and improved traditional bins are promoted.

This clearly shows that the district has a lot of potential for storage facilities which largely remains underutilized.

The agriculture sector still suffers from a number of challenges including: low crop yield, farming technologies with limited input use and commercialization; insufficient farm mechanizations; inadequate commodity marketing support and land degradation due to deforestation and poor farming practices.

In order to improve agricultural (maize) production, government has put in place a number of support services including food security packs involving the distribution of seed and fertilizer at subsidized prices. Unsubsidized inputs are also readily available in various shops for sale. However the prices of these commodities are beyond the ability of most small-scale farmers. This results in small scale farmers' failure to produce enough food for their families as well as sell some to acquire income.

Government interventions through the Fertilizer Support Programme (FSP), has played a role in ensuring continued food production in the district. Table 6.5 presents the FSP input supply for Kabwe for the period 2006/2007 to 2009/2010.

Table 6.5: Fertiliser Support Program input supply for Kabwe District

Season	Fertiliser type	Quantity (Kg)
2006/07	Basal Dressing Fertilizer	22,800 x 50
	Top Dressing fertilizer	22,800 x 50
2007/08	Basal Dressing Fertilizer	10,000 x 50
	Top Dressing fertilizer	10,000 x 50
	Seed	4,936 x 50
2008/09	Basal Dressing Fertilizer	16,400 x 50
	Top Dressing fertilizer	16,400 x 50
	Seed	8,200 x 10
2009/10	Basal Dressing Fertilizer	25,288 x 50
	Top Dressing fertilizer	25,288 x 50
	Seed	12,644 x 10

Source: MACO/CSO Kabwe District, 2009

With continued government emphasis on diversification and support to the sector, agricultural productivity is likely to improve leading to higher productivity and improved food security.

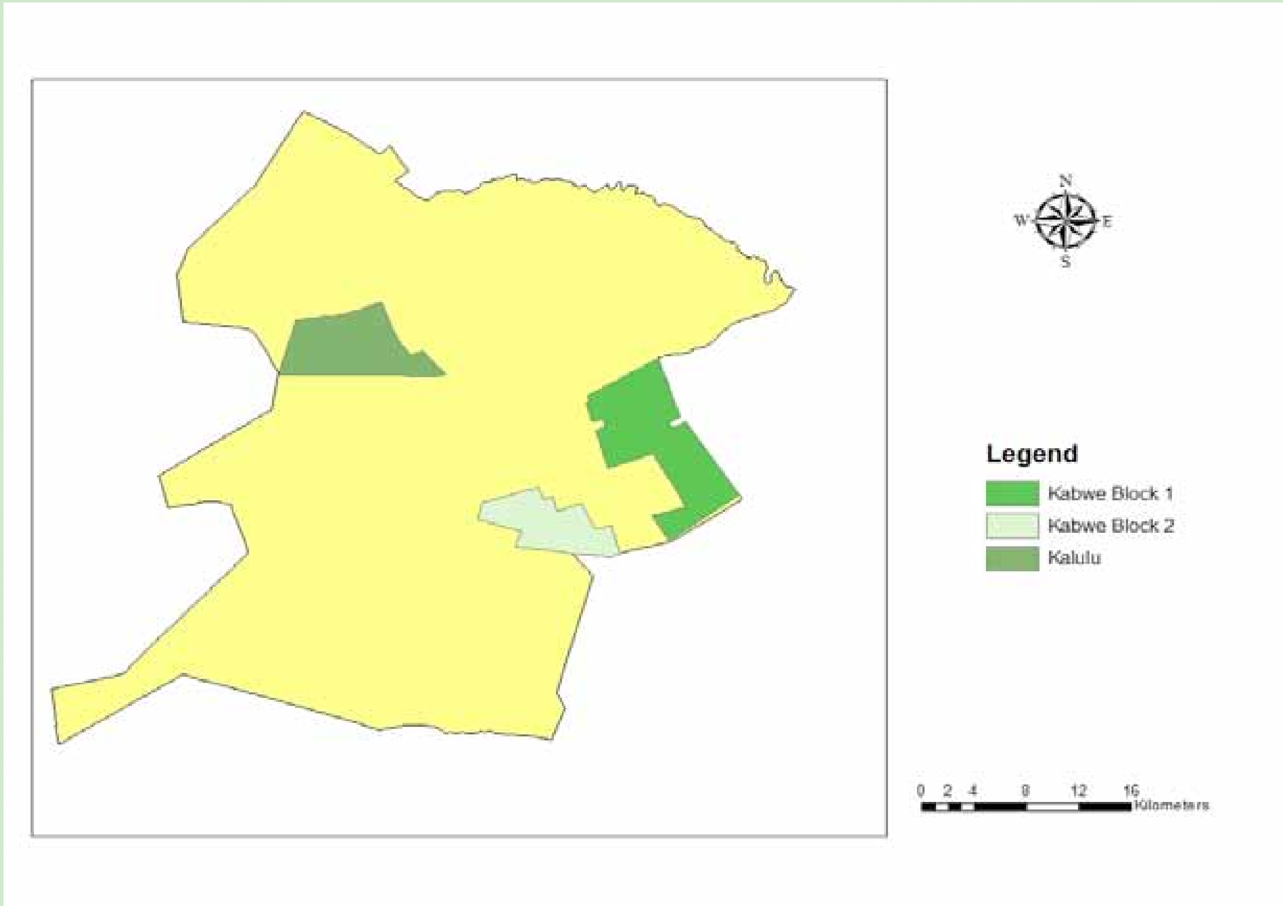

Figure 6.4: Forestry Reserves in Kabwe

6.3: Forestry

The district has two forest reserves namely Kabwe National Forest which comprises Blocks A and B (10,010ha) and Kabwe Extension known as Chibanga Forest (152ha) and Kalulu Local Forest (4,738 ha). The district has a plantation of about 27ha of Gmelina species, 2ha of Pine species and 3ha of Eucalyptus species. The main species of the trees in the reserves are the Brachystegia species (Mutondo), the Combreturm species, secondary generation of Pterocarpus species (Mukwa) and the Albizia species.

One of challenges to the forest resource base in Kabwe is deforestation due to encroachment and unsustainable exploitation especially charcoal production. Encroachment in all the forest reserves is high. At national level, forests are being lost at an average of 350,000ha annually (ILUA, 2008).

The Kalulu Forest situated in the northern part of Kabwe was gazetted as a local forest to provide forest products and services to the local community on a sustainable basis. One of the key purposes for which it was gazetted is to protect and enhance ground water resources. This aquifer is a source of water for the district. However, a number of families have settled in the forest reserve and these have put pressure on the forest resources by clearing the land for farming and charcoal production. In view of the encroachment, there is a danger of contaminating the aquifer from sources such as fertilizers and faecal matter from pit latrines.

Other factors contributing to deforestation in Kabwe are uncontrolled bush fires, demand for agricultural land and settlements, wood fuel, poles and timber for construction purposes. Consequently, this has been exacerbated by the poor performance of the forestry sector attributed to the following:

- The lag in effecting the new Forest Act has contributed to problems in clearly defining the governing statutes on forest resources;

- Lack of transport and other resources by the Forestry Department to effectively carry out field activities both for enforcement and educational purposes;
- Limited community participation in forestry conservation;
- Poor funding for the district;
- Institutional weaknesses within the department and;
- Limited application and use of emerging technologies to manage forestry resources.

In response to the challenges identified in the sector, a number of interventions have been put in place. Currently environmental education programmes have been undertaken and communities such as Kizito and Kafulamase have been trained in natural resource management and community committees have been formed.

Women are the main users of the forestry resources as they are involved in fuel-wood collection for domestic use. It is therefore important that forestry management skills are targeted at them. For this reason, a number of training programmes in areas such as bee-keeping, mushroom growing and forest conservation have been undertaken.

7. SCENARIOS AND POLICY ACTIONS

The future is inherently uncertain and unpredictable. Despite the uncertainty of outcomes, forward looking analyses can be conducted. Scenarios are indispensable tools for environmental management that focus on large-scale, long-term interactions between development and environment (UNEP; 2006, 412). They are an outline of a natural or an expected course of events and are neither predictions nor forecasts. Rather, each scenario is one alternative image of how the future might unfold. Scenarios will vary considerably with the intended uses. They are useful tools for assessing either the future implications of current environmental problems or emergence of new problems.

This chapter discusses possible scenarios within the context of thematic areas which are; Socio-economics, Mineral Resources, Land, and Water Resources. The base year used for this report is 2000 and the time horizon is 2000 to 2030 in line with the country's Vision 2030. The chapter provides three scenarios namely the; (i) Business As Usual (ii) Policy Reform and (iii) Investment Scenarios.

In the **Business as usual Scenario,** an analysis of the current situation for each thematic area has been conducted using baseline data. The scenario recognises the various current interventions being undertaken to achieve sustainable development. Further, analyses of the consequences of not taking appropriate actions and their impact on the environment have been discussed.

The **Policy Reform Scenario** recognises that in order to achieve sustainable development in the district, there is need to develop policies that support economic growth and appropriate levels of service delivery. It proposes policies that need to be put in place and implemented to address specific and probable problems that arise in the various sectors. These include policies that support improved planning, service delivery, compliance to set regulations and leadership in environmental management. This scenario also acknowledges the need for active participation of stakeholders in national development.

In response to issues and policies identified in the Business As Usual and Policy Reform Scenarios, the **Investment Scenario** proposes investments required in the identified sectors to improve the district's socio-economic status. This scenario recommends economic and industrial growth, technological innovation, value addition and improved provision of resources as key elements to sustainable development.

7.1 SOCIO-ECONOMICS

Scenarios for socio-economics focus on the following key issues: population growth, provision and investment in basic services such as education, health, water and sanitation.

Business as Usual Scenario

In 2000, Kabwe had a population of 178,341 divided into 34,203 households and with the annual population growth rate of 0.5 percent. Although the population has continued to steadily grow, the population growth rate has been on the decline from below 7 percent between 1969 and 1980 to 0.5 percent between 1990 and 2000. Nonetheless, settlement patterns and provision of social services have been affected by population growth. This is particularly so for peri-urban areas where the highest population in the district is concentrated. These areas have been faced with limited access to basic services such as water and sanitation, waste management, education and health facilities.

Since the introduction of free basic education, the enrolment of children has increased and thus required corresponding increase in the number of classroom space. At the basic school level, there are currently 746 classrooms against the pupil population of 49,508 and a teacher population of 1,721. Similarly at high school level, infrastructure development has been stagnate and has affected access to higher education.

The economy of the district had been predominately dependant on mining related activities. For this reason, the closure of the mines and major industries in Kabwe resulted in high levels of unemployment in the mid 1990's to early 2000 thereby causing high poverty levels. In 2000, 63 percent of the population of Kabwe district was classified as being poor. Majority of the people in the district are predominately in the informal sector.

For the health sector, a number of measures have been put in place to reduce incidences of diseases such as Malaria and HIV/AIDS. This can be attributed to increased malaria control programmes such as Indoor Residue Spraying (IRS) and use of mosquito nets. In addition, increased HIV/AIDS awareness programmes alongside provision of Anti Retroviral Treatment (ART) have played a role in reducing HIV infections.

In the Business As Usual Scenario, it can be observed that the population growth has not been met with corresponding provision of basic social services. This is so because trends indicate that although progress is being made in the provision of basic social services, there still exist, disparities in service provision between urban and rural areas. Further, service provision in many peri-urban areas continues to be limited. Therefore, it is vital that necessary interventions are put in place to improve the socio-economic status of the district.

Policy Reform Scenario

In order to support the development of the district, there is need to develop policies that will support economic growth and appropriate levels of basic service delivery.

There is need for investment in the regulatory, institutional and structural reforms that will promote increased private sector involvement. This is in recognition of the large number of people engaged in various economic activities in the informal sector. Measures should be undertaken to provide and increase financing opportunities to programmes such as those provided under the Citizens Economic Empowerment Commission (CEEC) and Youth Empowerment Programme.

There is need for population policy implementation aimed at improving quality of life of people through achievement of population trends commensurate with socio-economic development i.e. to attain and maintain a population growth rate that is at least three times lower than the rate of economic growth.

Policies should be carefully coordinated and tailored to pro-poor growth associated with the development of agriculture, agro-processing, manufacturing and small scale entrepreneurship. Value addition should be promoted in all sectors.

Health reforms, which emphasize decentralization to the district level and introduction of the "Essential Health Care Package", which defines key interventions that the public health system should provide within available resources should be promoted. Programmes aimed at reducing incidences of diseases such as Malaria and HIV/AIDS should be strengthened.

The proposed policies in this scenario if implemented would result in improved provision of basic social services and livelihood of people.

Investment Scenario

In line with issues and policies identified in the Business As Usual and Policy Reform Scenarios, the Investment Scenario has been proposed to improve the socio-economic status in the district.

To address issues raised in the various sectors, there is need to invest in social capital through enhancing provision of basic services such as education, health, water and sanitation. There is need to develop and maintain productive and social infrastructure and services such as roads, storage facilities, communication systems, public utilities and other services. In terms of the road infrastructure, there is need to expand the road network in view of the transitory role played by the district. Additionally, to improve service delivery, there is need for government to invest in upgrading existing schools and public tertiary institutions.

Implementation of measures discussed in the Policy Reform and Investment Scenarios will result in economic development and improved provision of basic social services within the district.

7.2 LAND AND AGRICULTURE

The main land use types found in Kabwe are residential, industrial, commercial, agriculture and forestry.

Business As Usual

According to the existing land development plan, the total land available for development in Kabwe is approximately 1,372 ha. All land in the district falls under leasehold (state land) tenure category.

Demand for land in the district has been increasing. Some factors causing increased demand for land include urban migration, population and economic growth. However, land use planning has not been easy and areas with mixed land uses are common. Government support to the agriculture sector through programmes such as Fertilizer Support Programme (FSP) has played a role in ensuring continued food production in the district.

The district is faced with a challenge of limited availability of land for expansion. Illegal allocation of plots and other development projects in unsafe areas such as the lead contaminated areas has continued with new developments occurring in these areas.

The development of an appropriate urban structure for the expansion of the district has been constrained due to the fact that to the:

i. North east of the built-up area, the barracks, agriculture research station and military training area form a barrier to expansion and much of the latter is a dambo;
ii. North of the district, much of the area is dambo, draining northwards to the Chankwakwa stream;
iii. Northern edge of the district is a planned commercial area but most of it is encroached; and
iv. West of Mukobeko township is Kalulu Forest Reserve. The area cannot be opened up for development as it is a water recharge area.

One of challenges to the forest resource base in Kabwe is deforestation due to encroachment and unsustainable exploitation especially charcoal production. The main contributors to land degradation include deforestation, quarrying, waste disposal and soil degradation.

Policy Reform

To sustain the districts land resource, sound management practices should be adopted for all forms of land uses such as agriculture, industry and forestry.

As a way of addressing challenges regarding unplanned settlements in areas such as Makululu, policy to upgrade and service provision by KMC should be embarked on. In addition, policy that supports regular updating of the valuation roll to provide information on properties reflecting their actual ratable value should be promoted. Further, Integrated Development Plans (IDPs) should be promoted in order to provide a sound basis for district planning and development.

With continued government emphasis on diversification and support to the agriculture sector, productivity is likely to improve leading to higher productivity and improved food security for the district. Policy intervention that supports the diversification programme should thus be promoted.

In order to protect the forest resources in the district, the revised Forestry Policy should be implemented and the Forestry Department should continue to effectively carry out field activities both for enforcement and educational purposes.

Investment Scenario
Investments aimed at addressing sustainable land use practices should be strengthened. In line with this, resources should be allocated to KMC for undertaking planning and effective implementation through stringent development control. It is imperative that government through the Ministry Local Government and Housing to build the institutional capacity of KMC to enable it effectively discharge its mandate in land use planning and development.

Additionally, investment into the application and use of emerging technologies such as remote sensing to manage forestry resources in the district is required. Strengthening the information system on land for the district will be required to provide efficient and reliable information and thus reduce opportunities for mismanagement.

This therefore means that proposals discussed in the Policy Reform and Investment Scenarios should be adopted in order to improve access and management of land in the district.

7.3 WATER AND SANITATION

The main issues discussed in the water sector scenarios are availability of water, access and quality.

Business As Usual

Kabwe obtains its water from both ground and surface water sources. LGWSC is the main provider of water and sanitation services in the district. There are variations in water supply within the district with 44 percent using hand dug wells. The implication of this is that, the majority of Kabwe residents do not have access to clean water and are thus at risk of being affected by water borne diseases such as Cholera and other diarrhoeal diseases. Proliferation of unplanned settlements has further exacerbated this problem because whilst there has been population growth in these areas, this has not been matched with corresponding service provision in terms of basic services such as water and sanitation.

There has however been a steady increase in the number of people with access to safe water supply. This can be attributed to a number of interventions such as the Africa Development Bank (ADB) supported project which was initiated to revisit and improve water supply and sanitation service provision. Further, LGWSC has also sunk 12 new boreholes in addition to the nine (09) old boreholes. The Highridge and Mukobeko pump stations have also been rehabilitated. The interventions have resulted in improved service delivery in the district. Although the above interventions have been put in place to improve water supply, actual utilisation has been low due to costs and in some cases, distance.

To address improvement in sanitation provision, VIP latrines have been promoted in the peri urban areas within the district. Additionally, eco-sanitation is being implemented in parts of the district.

Most of the waste is disposed of indiscriminately in pits, open areas and by burning. Consequently, this has contributed to a number of problems such as blocking of storm drains, resulting into floods and the stagnant water become breeding grounds for mosquitoes. Currently, the actual quantities of waste generated in the district largely remain unknown.

Policy Reform
The Business As Usual Scenario shows that more households are likely to have access to clean water supply and sanitation in view of the interventions being undertaken. However, measures need to be carried out to address the disparities in service provision especially in peri-urban areas. For this reason, policy review on housing and enhanced enforcement of the Town and Country Planning Act is required so as to halt establishment of unplanned settlements. In addition, upgrading of unplanned settlements should be undertaken in order to allow for service provision including water supply and sanitation in these areas.

Investment Scenario
To cope with demand for water and sanitation services, water reticulation networks should be expanded to meet the demand for water supply. There is need for LGWSC to invest and build capacity to improve water supply and sewerage coverage. In order to address the challenge of waste management in the district, investment into development of disposal site and subsequently, modern landfill should be undertaken by KMC. Further, involvement of the private sector and community based entrepreneurs in waste management in the district will be required.

The projected economic activity in the district may continue to increase and is likely to exert increasing pressure on provision of basic services such as water, sanitation, waste generation and housing which are inadequate as discussed in the Business as Usual Scenario. The Policy Reform and Investment Scenarios propose measures required to improve water and sanitation related issues in the district. Implementation of a combination of these two scenarios is preferred in addressing the identified issues.

7.4 MINERAL RESOURCES

Kabwe district is rich in mineral resources such as lead and zinc.

Business As Usual
Kabwe's mining and mineral processing operations were undertaken during a period when statutory environmental controls within the mining sector were almost non-existent. During the later years of ZCCM operations, poor economic performance also inhibited environmental due diligence. Closure of the mine in 1994 consequently left a substantial legacy of environmental hazards some of which persist today.

Prominent environmental problems arising from mining activities include land degradation, water pollution and air pollution. Lead pollution has been identified as a major health hazard in Kabwe. Communities mainly affected by lead contamination are mostly former mine townships and surrounding communities including settlements along the main canal. These are; Kasanda, Makululu and Makandanyama on the western side, Chowa, Waya and Katondo (along the canal) on the eastern side and Mutwe wa Nsofu on the southern side of the mine plant area. Poor vegetation cover results in a dusty environment especially in the dry season and also contributes to the spread of lead dust thereby increasing the risk of lead inhalation.

To address environmental impacts arising from mining activities in Kabwe, some of the measures undertaken include; development of a Five year District Development Plan (DDP) for the period 2006 to 2010, mine plant rehabilitation, removal of mine waste from residential areas and improving water supply lead contaminated areas through dust suppression and greening.

Despite some of the negative impacts of mining in Kabwe, the opening of new mineral processing companies such as Sable Zinc, Fine Steel, ZALCO and Chiman Manufacturing Ltd have contributed to the economic growth of the district.

Investment Policy
To address the environmental issues arising from mining related activities, there is need for continued investment in programmes such as Environmental Management Facility (EMF) aimed at addressing environmental liabilities that were not taken by new mine owners. In view of this, investment into interventions undertaken with support from the CEP should be continued.

Additionally, improved resource allocation to regulatory agencies such as ECZ and Mine Safety Department (MSD) is necessary so as to enhance compliance in the sector. Economic incentives to attract investment in the district are required to alleviate poverty levels in the district as well as support the growing informal sector within the district. Consequently, policy reform will thus be required to compliment investment initiatives in Kabwe.

Policy Reform
To prevent and minimize environmental impacts as a result of mining, strengthening of institutional and legal framework will be required. There is need to strengthen legislation and institutional capacity of regulatory agencies among them ECZ, MSD and Ministry of Mines and Minerals Development. Monitoring and enforcement through EIAs, EMPs and audits should also be strengthened.

Further, review of enforcement of KMC by-laws to ensure implementation of lead (Pb) Mitigation measures is required. This should encompass risk management programmes which promote expansion of the greening exercise, nutrition supplements and monitoring trends in blood lead levels alongside other mitigation measures.

It can be observed that the interventions embarked on under the CEP have potential to change the future scenario of mining liabilities in Kabwe and their impacts on the socio-economic status of Kabwe residents. Sustained implementation of these interventions alongside others will significantly help reduce the risk of exposure to sources of lead poisoning. This will result in improved health among the residents of Kabwe residents especially the young children who are at high risk.

As can be observed, implementation of measures proposed on the Investment and Policy Reform Scenarios will help address the environmental issues arising from mining related activities in Kabwe district.

1.5 POLICY RECOMMENDATIONS

The following actions for policy are recommended in order to address identified environmental issues in the Socio-economics, Land, Water and Sanitation and Mineral Resources sectors of the district.

Socio-Economics

a. Implement the Decentralization Policy to enhance service delivery at the local level alongside other empowerment programmes such as the Citizens Economic Empowerment Commission (CEEC) to avail resources to the local community;

b. Implement pro-poor policies in order to improve the socio-economic status of the district;

c. Improve the road infrastructure in the district by reviewing policy on revenue generation such as introducing toll gates to levy vehicles passing through Kabwe;
d. Road network design should include provision for pedestrian walkways and bicycle lanes;

Land and Agriculture
a. To enhance agricultural productivity and food security, support in form of input support and relief food distribution. There is need for policy review to expand this support to include land preparation and weed control as labour constraints.

b. Revamp extension services for the farmers alongside promotion of conservation farming methodologies;

c. Promote the growing of traditional composite seed and allow farmers a choice to use hybrid or composite seed depending on their resource status.

d. Reduce dependency on rain fed agriculture and ensure that the irrigation policy and strategy is implemented to allow many farmers implement irrigation projects.

e. Build the institutional capacity of the KMC to enable it effectively discharge its mandate in land use planning and development.

Water and Sanitation
The following actions for policy are recommended in order to address identified environmental issues in the Socio-economics, Land, Water and Sanitation and Mineral Resources sectors of the district.

a. Policy review and enforcement on allocation of residential plots to ensure that only areas serviced with water supply are allocated.
b. Policy review on housing and enhanced enforcement of the Town and Country Planning Act to halt establishment of unplanned settlements.
c. Upgrading of unplanned settlements to allow for provision of services including water supply and sanitation.
d. KMC to create a Solid Waste Management Unit to work with community based entrepreneurs in the district.
e. Strengthenining laws on the constraction of dams by farmers.
f. Expanding the capture of LGWSC coverage in water and sanitation services delivery.

Mineral Resources

a. To address the problem of lead contamination, exposure and effects on human health, there is need to continue with risk management programmes which promote expansion of the greening exercise, nutrition supplements and monitor trends in blood lead levels alongside other mitigation measures.

b. Review of housing and other town and country planning Act together with improved enforcement of its provisions to ensure that risk areas are avoided in designating residences and other land use activities.

c. Review an enforcement of Kabwe Municipal Council by-laws to ensure implementation of lead (Pb) Mitigation measures.

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Annex 1: Stakeholders and their Services in the Health Sector

S.NO	ORGANISATION	CATCHMENT AREA	PROGRAMME FOCUS AND ACTIVITIES
1	Defence(ZAF, Chindwin, Chima and ZNS) Home affairs(Mpima Prisons, Mukobeko Maximum and Mukobeko Medium Prisons	Kohima, Chindwin, Mpima, Mukobeko Prison, ZNS, ZAF and Central Police	• Preventive, promotive and curative services
2	District Education Board Secretary(Ministry of Education)	Kabwe District	• Provision of school health services e.g. de-worming of pupils • Provision of safe water and sanitation • IEC on good nutrition.
3	District Veterinary Department	Kabwe District	• Provision of preventive services e.g. surveillance and control of rabies
4	Social Welfare Department	Kabwe District	• Material support to the vulnerable in society
5	Agriculture	Kabwe District	• Food security and safety in homes • Education on good nutrition (SHIN) • Material and human resource provision
6	Kabwe Municipal Council	Kabwe District	• Refuse collection • Inspections of public premises • Enforcement of public health regulations
7	National Malaria Control (NMCC)	Kabwe District	• Capacity building in malaria prevention control and management • Provision of supplies for diagnosis and treatment • Provision of ITNs IRS chemicals, IVM chemicals. • Training of spray operators and orientation of trained health staff • Funding of IRS activities.
8	Kara Counselling	Kabwe District	• IEC in HIV/AIDS, HIV counselling and testing.
9	Society for Family Health	Kabwe District	**REPRODUCTIVE HEALTH** • Family planning • HIV/AIDS/STDs • Condom distribution • IEC • Peer Education
10	ZPCT II	Kabwe District	• HIV prevention, testing and care • Provision of medical equipment • Provision of non-medical supplies • Technical support • PMTCT supervision and updates training youths • Data management capacity building and support of staff • CD4 count referral promotion and support • Infrastructure development

11	Care International	Kabwe District	• Capacity building of home based care services to trained staff and community • Provision of medical supplies • Control of malaria in chronically ill.
12	ROTARY CLUB	Ngungu, Nakoli, Bwacha and Katondo	• Health centre maintenance • Material support and equipment
13	JSI	Kabwe District	• HIV test logistics system assessment • Capacity building in quantification of drugs • Technical support
14	Infant and Young Child Nutrition (IYCN)	Bwacha, Railway Surgery DHO	• Training in Infant and Young Child Feeding
15	Health Communication Program (HCP)	Mahatma Gandhi, Pollen, Railway Surgery, Katondo, Kasanda	• IEC on HIV prevention and control • Provision of IEC materials and audio visual equipment
16	ZCCM-IH or Copper belt Environmental Project (CEP)	Makululu, Chowa, Katondo Kasanda, Railway surgery	• Lead poisoning mitigation • Capacity building on lead poison management to community and health staff • Provision of safe water and environment
17	Community Youth Mobilisation (CYM)	Kasavasa	• HIV mitigation • Capacity building of care givers • IEC on safe sex practices • Youth empowerment
18	Zambia AIDS Related Tuberculosis (ZAMBART)	Ngungu, Bwacha and Makululu	• Co-existence of TB and HIV research studies
19	Arch-Dioceses of Lusaka	Chindwin, Chowa, Mukobeko, Ngungu and Bwacha	**HIV/AIDS/TB** • Home based care • Behaviour change and communication • Training • Income generating activities.
20	Health Services and Systems Programme (HSSP)	Kabwe District	• Technical support • Capacity building on health service delivery • Funding of IRS activities
21	Salvation Army	Kabwe District	**HIV/AIDS/TB** • Training of community in home based care services • IEC in behavioural change and communication. • Income generating activities. **MALARIA** Distribution of ITNs to the chronically ill Training of community in malaria prevention and control
22	Chreso Ministries	Kabwe District	TB and ART services
23	DACKANA Home Based Care	Kabwe District	Home Based Care services
24	Jesus Cares Ministries	Kabwe District	Home Based Care services
25	Mental Health Association-Kabwe	Kabwe District	Rehabilitation of mental health services users
26	Kabwe General Hospital	Kabwe District	Management of referred cases

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