CICRED UG4. Project

Project Title: **Population, Urban Development and the Environment in Uganda: The Case of Kampala City and its Environs**

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(~~SUMMARY~~ REPORT)

ACRONYMS

EMS	Environmental Management Strategy
ERL	Environmental Resources Limited
GIS	Geographic Information Systems
GPS	Global Positioning System
FDI	Foreign Direct Investment
JET	Journalist Environmental Association of Tanzania
KCC	Kampala City Council
KDMP	Kampala Drainage Master Plan
LC	Local Council (LC 1 – LC 5)
LGDP	Local Government Development Programme
MUIENR	Makerere University Institute of Environment and Natural Resources
MoFPED	Ministry of Finance, Planning and Economic Development
MOHUD	Ministry of Housing and Urban Development
MPED	Ministry of Planning and Economic Development
MWLE	Ministry of Water Lands and Environment
NEMA	National Environmental Management Authority
NWSC	National Water and Sewage Corporation
P/D/E	Population Development and Environment
RS	Remote Sensing
SAPs	Structural Adjustment Programs
UBS	Uganda Bureau of Standards
UBOS	Uganda Bureau of Statistics
UEPF	Uganda Environment Protection Forum
UIA	Uganda Investment Authority
UMA	Uganda Manufacturers Association
U/P/E	Urbanization Population and Environment
VCM	Vicious Circle Model
VECs	Valued Environmental Components

Table of Contents

List of figures

List of tables

List of maps

List of plates

List of boxes

List of appendices

Part I: Team members

Name and Address	**Responsibilities**
Assoc Prof J B Nyakaana Scientific Coordinator Geography Department P O Box 7062 **KAMPALA** dr_nyakaana@arts.mak.ac.ug	• Collect data/information on Environment and Population, issues and relevant policy issues • Supervise the collection of data/ information for the project • Coordinate the activities of the project • Compile presentations of the team members into one document • Financial administration of the project • Financial administration of the project
Assoc Prof H Sengendo Team member Faculty of Arts P O Box 7062 **KAMPALA** hsengendo@arts.mak.ac.ug	Collect data/information on:- • Urban Housing, demands, quality gender issues • Settlement • Relevant policy issues • Proof reading and harmonizing document
Mr Lwasa Shuiab Team member Urban Planning Unit P O Box 7062 **KAMPALA** lwasa_s@arts.mak.ac.ug	Collect data/information • General information on Kampala (spatial digital information/data) • Urban Planning • Industrialization and associated issues (migration, pollution, employment) • Coping strategies • Relevant policy issues • Processing of digital data • Word processing the document

Note: The other team members dropped out as two are abroad for further studies and the third one is very busy with his Ph.D research

Part II: Description of research operations

Commencement of the research project

The research project started in 2003 after signing of the agreement between CICRED and Geography Department, Makerere University. At the project development stage, it was understood that the project would employ largely secondary data materials to analyze the population, development and environment relationships. During this stage the research also carried out a preliminary survey of data sources which were identified and utilized in the project implementation.

Brief summary of approach

A number of research activities shave been undertaken through out the project implementation period including research team meetings, field data collection, organizing and holding Focus Groups Discussions, carrying out reconnaissance surveys, data processing and synthesis. These are described in details below;

Meetings

Through out the project period, meetings of the research team formed an important component of executing the project to ensure that all team members have a clear understanding of the research requirement to pursue the research objectives. Meetings were held since 2003 on a quarterly basis. During these meetings, team members were assigned tasks on which they would have to report in the subsequent meeting. One of the outputs of these meetings was to clarify research issues through brainstorming and validation of information collected. This was an interactive process of brainstorming and data collection to ensure that the research protocol set out in the proposal was adhered to. Meetings were also held between the team members and the International Scientists who visited the team. In March 2004, Dr. Alex deSherbinin paid a visit to offer scientific backstopping to the team. Through the meeting several important aspects related to the project were discussed including population issues of fertility and migration as well use of the e-library available at the population-environment-research network website. In November 2005, Dr. Bernard Callas also visited the team for purpose of acclimatization on the project and visiting some sites of interest for the project.

Data collection

As outlined in the research proposal, the project largely relied on secondary data sources to make use of the various statistical data and reports scattered around in various agencies and government departments. For validation purposes, limited field work was conducted in which FGD's were held and activities observed in the study area. Data collection was conducted following the list of sources developed at the project development stage and tasks were distributed among the project team members who visited different government agencies including data banks, KCC, ministries and the dissertation data banks in different faculties and institutions of the University. National, sectoral and site specific reports were collected and utilized in the research. Additionally, electronic sources were also utilized to elicit data on earlier studies and processed statistics concerning the research issues. National spatial data archives were also consulted for remote sensing data and this was supported by purchased data for archives that were not readily available.

Focus Group Discussions
Focus Group Discussions were organized by the team to get the community perspective of urban development and environmental challenges. Since the target communities were mainly those experiencing higher environmental burdens, two representative communities were visited in Bwaise III and Mulago III both of which have phenomenal environmental burdens. Where as the major environmental burden of the Bwaise community is flooding, that of Mulago is solid waste accumulation and both share similar magnitude of sanitation problems. This gives a community perspective on different issues raised in the research proposal but both enlightened the research team with the experiences of recent migrants, industrialization and sanitation issues.

Reconnaissance surveys
Reconnaissance surveys were organized for the research team to get a feel of the environmental burdens experienced and challenges in the various parts of the city while also getting information on development patterns and industrialization. The major method employed during reconnaissance surveys was photography, which has enriched the report through field-based evidences on the research issues. A total of 4 reconnaissance surveys were conducted with two between January 2004 June 2004, August 2005 and January 2006.

Date	Areas visited	Major observed issues
February 2004	Bwaise, Mulago III, Kinawataka, Banda	Informal settlements, environmental burdens
May 2004	Eastern Kampala, Munyonyo, Kawempe	Ground truthing of classified map

Data processing
Data processing and analysis was conducted by the individual research team members for outputs, which would be incorporated into the consolidated report. Various methods and activities were accomplished to process data. For statistical data, much of it was collected pre-processed and the team members did further analysis in the context of the research. For example data on industries, census data were collected pre-processed but required analysis in the context of the research. On the other hand remote sensing data was analyzed using image analysis software by the team. As indicated in the report**,** supervised classification of the remotely sensed data was utilized in addition to review earlier studies on land use mapping. FGD data was mainly qualitative and thus processing was largely accomplished in the field through content analysis. However in the synthesis meetings, the deduced information would be discussed and further summarized to be integrated into the report.

International Scientist visits
As indicated earlier, two International Scientists paid visits to the team to assess the project and activities undertaken. These visits mainly involved initial meetings and site visits.

Synthesis meetings
Following on the quarterly meetings, the team synthesized the data collected and analyzed to integrate into the report. There were however additional meetings to finalize the structure and content of the report. Important to these meetings was also discussion of the scientific reviewers' comments to improve on the report.

Abstract

Uganda is experiencing rapid urbanization estimated at an annual growth rate of 5.5% while Kampala has remained a primate city since 1969 growing at annual rate of 5.61%. With this growth rate, Kampala absorbs 40% of the national urban population and 4.9% of the national population in (UBOS 2002). Kampala's growth and development is characterized by the sprawl into hitherto rural areas engulfing formerly satellite towns within a radius of 32 kilometers. The urbanized area has developed into a metropolitan area spanning approximately 386 square kilometers. But the growth and expansion associated with lack of infrastructure, social services poses planning and environment problems. The challenge is how to address the problems through pro-active policy and concerted effort by the city authority, government, civil society and public. This research examined the relationship between population, development and environment in Kampala and its immediate environs for policy action that would promote sustainable urbanization and development of Kampala metropolitan area. Kampala is selected because of its strategic and functional roles being a commercial, industrial, administrative, social, economic and cultural hub of Uganda. The study combined several research methods but largely depended on secondary data from various reports, and policy documents dotted around in different agencies, which have tried to address the environments development issues of the city. Remote sensing techniques and GIS were also utilized to spatially analyze the relationships between population, development and environment with a focus on housing, industrial development and how they relate to pollution, land cover change, challenges of waste management and sanitation in the metro area of Kampala. From the study findings, it's apparent that Kampala is faced with the environmental problems that are putting pressure on the existing infrastructure while the poor settlements are beset with environmental burdens that are deteriorating the well-being of the dwellers. As the environment deteriorates, so is the increase in poverty due to reliance by the urban poor on natural resources through urban agriculture, natural resource extraction, informal production and trade as coping strategies. To respond to these challenges, some policy recommendations are proposed to break the vicious circle of population, environment and poverty.

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1. Introduction to the Study

Kampala city in Uganda has experienced rapid population growth having increased from a total of 774,241 in 1991 to 1.2 million in 2002 and at annual growth rate of 5.61% (UBOS 2002). The growth, which has occurred concomitantly with changes in the population structure of the city, is largely influenced by rural-urban migration with natural increase playing a less significant role. The increased population within Kampala metropolitan area has stimulated demand for employment, land for housing, social services and infrastructure subsequently leading to a fast spatial urban development and industrialization process. Though the current urban development can be applauded due to increase in employment opportunities, housing stock, social services and expanding infrastructure, such development is occurring in a haphazard manner largely dominated by the urban informality in most of the sectors and it is also progressing inequitably leaving sections of the population polarized**.** This has greatly contributed to the unsustainable utilization of natural resources within the metro area resulting in environmental degradation through solid and human waste accumulation/poor management, wetland encroachment and destruction, water pollution and land use/cover change that is reducing the ecological services from the natural environment of the metro area(NEMA 2000/01; Matagi 2001; Reid 2005). The resultant living environment of especially the urban poor in the city is deplorable with poor sanitation and, inadequate housing, poorly managed solid and human wastes, increased water pollution and reduction in ecological services. Consequently this has exacerbated vulnerability of Kampala's population and communities to natural disasters. Coping strategies have been devised by the urban poor for their adaptation to urban economy and environment. As a multi-disciplinary study, this research evaluated the demographic changes in Kampala and their influence on the environment through urban development focusing on housing, industrialization and economic activities in the metro area.

1.2 Research Issue and Conceptual Framework

As observed by (Reid 2005), humans have changed the ecosystems and environment more rapidly and extensively in the 1990s than in any comparable period of time in human history. Through the human dimensions of socio-economic, political and cultural globalization processes, people are at the center of environmental change at the global level. While local environmental processes are largely driven by demographic characteristics, composition and structure as derived from the human dimensions processes (IHDP 2005). Commencing from the UNICEF hypothesis of population, environment and poverty vicious circle(UNICEF 1994), the study evaluated the impact of the background factors of demographic changes i.e. population growth, composition and migration and how they accelerate the urbanization process through urban development, industrialization, poverty and housing. Analysis of the relationships between development, population and environment focuses on their interactions with environmental degradation i.e. wetland degradation, solid waste accumulation, land use changes, water pollution, human waste management and sanitation. The research examines the relationship between population, housing, existing infrastructure like water supply, sanitation and solid waste disposal in the metro area. The study also analyses how vulnerable groups (low income, women, street traders, children, unemployed) have devised coping strategies further impacting on the environment through informal activities and unplanned housing provisioning. This research analyzes the interactions of population dynamics, urban development processes with the environment on the basis of which pro-active policy recommendations for sustainable urban development are suggested.

1.3 Scientific objective

The general objective of the study was to analyze the relationships between population, urban development and environment to formulate pro-action policy recommendations for sustainable urbanization.

Specific objectives

- Examine the trends of population growth and its impacts on the environment through livelihood strategies
- Review the physical expansion and planning evolution of Kampala as influenced by population factors.
- Assess the trends of industrialization and its role in generating migrants and unplanned housing
- Assess the levels of water pollution due to industrialization and solid waste management
- Examine the relationship between population growth, urban development and wetland degradation.

1.4 Scope and purpose of the research

The research recognizes the relationships and depth of issues that explain the UNICEF hypothesis(UNICEF 1994) but the focus of the research was based on a conceptual framework which targeted population variables of totals, distribution and migration and how they relate with urban development issues of housing, industrialization and poverty to bring about environmental changes. Likewise, given the functional nature of urban systems, focusing on Kampala administrative boundaries alone proved a shortfall in understanding the dynamics of environment in the region. Therefore this research extended analysis to the regional metropolitan area of Kampala that spans approximately 386 square kilometers as its environs and entails several hitherto satellite towns around Kampala city.

1.5 Organization of the report

The study report is organized in eight chapters. chapter one presents the introduction and background to the study, chapter two reviews literature, chapter three details the methodology followed in the research, chapter four presents the population dynamics as background factors for urban development and change, chapter five presents the development trends of Kampala, chapter six analyses the interactions of population, development and environment by focusing on environmental changes and problems experienced in the study area. Chapter seven examines the adaptation and coping strategies of the urban poor in the face of changing and deteriorating environment and policy. Chapter eight presents the emerging issues, recommendations and conclusions drawn from the study findings.

CHAPTER TWO: LITERATURE REVIEW

1.0 Introduction

This chapter presents the review of literature that offers a basis for the study issues. Literature on studies concerning population dynamics, urban environment, housing and industrialization is reviewed and how these relate to environmental degradation. The chapter is divided into three parts; a review of literature on population dynamics in Uganda and Kampala in particular; the second section reviews of the trends of development and the third section reviews the environmental aspects of the research. A synthesis of how these interact is presented in the conceptual model for the study. The chapter closes with identification of the gap, which the research findings attempt to bridge.

2.1 Population Issues

Data on population was obtained from the national census reports of 1969, 1980, 1991 and 2002(UBOS 1991; UBOS 2002). However research documents, which handle specific issues on population, were also consulted. Mukulu (1994), Adeokun (1994) and Matovu (1994), MPED (1992) looked at methodology of integrating population data in development planning. This was useful in providing information and methods of integrating population and development. Building on the *Vicious Circle Model* (VCM) one of the hypotheses is that the natural environment provides opportunities to the poor to harness resources for a livelihood(de Sherbinin 2006). Therefore demand for labor increases to convert open-access natural resources (e.g. clay, timber products, food or fisheries) into household consumables. The result is household or individual level decisions that lead to societal environmental problems due to cumulative effect of natural resource extraction. Population variables of size, structure and migration are analyzed as background factors to urban development and environmental changes in Kampala. These are schematically represented in the conceptual model (Fig. 2.1).

2.2 Poverty Issues

Poverty and vulnerable groups as they relate to population and development have been documented and presented through workshops and conferences. Omwony Ojok (1995) studied and documented poverty and HIV/AIDS, (UBOS 1991; Bevan and Sewaya 1995; MoFPED 2000) looked at poverty as a multidisciplinary research agenda and Balihuta (1995) related education to poverty. Kayiso (1995) tried to establish the significance of SAPs in Uganda's attempt to alleviate poverty. Few studies (Sengendo 1997; MoFPED 2000; NEMA 2000/01)have attempted to relate population with environment. This study fills the gap and examines how poverty issues of employment, housing, and sanitation interact with the urban environment through coping strategies.

2.3 Environment

The Kampala District Environment Profile (NEMA 2000/01)is a general document covering the various environmental aspects of the district like wetlands, wildlife, waste management and population. It provides information on effects of human activities on wetlands and environmental implications of Kampala's physical features. This information was very vital for this study in trying to relate population, development and environment. It is recognized that this document gives a status quo of the environment in Kampala and its linkage to utilization of urban resources is through the various guidelines and regulations including a set on wetland use, environmental impact statements and environmental auditing. However an attempt to link population with the environmental state is one such gap that this study bridges to understand the driving forces of environmental degradation and how such processes can be mitigated from local

to city. A considerable amount of research has been conducted on different aspects of the environment in Kampala and its environs. On solid waste management, (UEPF 1995; Kanyonyore 1998; Mugabi 1998; Nyakaana 2000; Namakula 2003), considered different aspects of types, generation rates and management at household level. Mugabi considered urban commercial wastes, (Kanyonyore 1998) studied domestic solid waste and (UEPF 1995; Nyakaana 2000; Namakula 2003) considered waste management in Kampala in general. These studies provide vital information regarding the environment and solid waste issues in Kampala. This study used this information to relate waste generation and management to population environment relationships. Based on findings of these studies, proposals in this regard to appropriate measures to improve solid waste management through pro-active policy recommendations are forwarded. The study analyzes the infrastructure requirements for Kampala's garbage problem and the legal and regulatory requirements to sustain the established infrastructure. Studies have been carried out which indicate a deficiency in legal and regulatory framework as well as infrastructure requirements. KCC and The World Bank (2000) studied the level of garbage management and actors involved in garbage collection and disposal. While Plan International (PI 1997)studied the solid waste management problem and drainage. Sengendo (1997) also looked at governance and formulation of environmental strategy in Kampala.

On pollution (Droruga 1990; Kansime and Nalubega 1998; Handasah, IDC et al. 2002) considered the levels of pollution in different micro catchments of Lake Victoria as a result of the developments in the surrounding urban centers. (Kansimme and Nalubega 1998)studied aquatic pollutants and the effects on the distribution of planktons, (Handasah, IDC et al. 2002) identified five areas of consideration for pollution of lake Victoria namely; water hyacinth, industries, agriculture, human settlements and over population and illegal fishing, over fishing and legislation. Results from these studies are synthesized to relate population, development and environment in the metro area of Kampala. The study synthesizes all these studies to derive pro-active policy recommendations to enhance legal, regulatory and policy frameworks for urban environmental planning and management.

2.4 Development

Urban development was studied by focusing on urban housing, urban planning, industrialization and poverty indicators. Available studies in Kampala indicate that urban development is occurring in a haphazard manner despite the existence of urban plans, planning regulations and law. MoHUD (1990), The Kampala Urban study (1993), Kampala Structure Plan (1994) considered urban housing and planning. On the other hand MFEP (1994) carried out an inventory of industrial establishment in Uganda for different sectors. The statistics were very useful in determining industrialization levels and trends in Kampala. On coping strategies, Nyakaana (1999), considered the street traders, a vulnerable but important group of the Kampala business life.

Although studies as indicated in the preceding sections show a relationship between the environmental state and population, an analysis of the linkages between population development and environment has not been attempted. This study examined the interactions of population dynamics, development processes and environmental degradation.

2.5 Conceptual framework

Relationships between population and Environment relationships are high on the national development agenda. The global population trend is characterized by increase in population but also increased urbanization. As the world population increases, environmental challenges are escalating. Developing countries such as Uganda are facing serious challenges of providing for the increasing population in the face of globalization, plummeting environmental resources

polarization of poverty and environmental changes. Policy-makers in the developing countries need to address the intertwined problems of poverty and environmental degradation for sustainable development. When it comes to urban development, the nature, sizes and trajectory of development points to the needs for environmental management strategies for sustainability of urban areas. These environment strategies would address issues including housing, social services transportation and natural resource management. The renewed attention to urban development issues is manifest in the Millennium Development Goal 7 on Ensuring Environmental Sustainability and target 11 to improve lives of slum dwellers(UN 2005). This calls for policy reforms to address the challenges of urban environmental management.

The linkages between population dynamics, urban development and the environment have long been the subject of research (Sengendo 1997; de Sherbinin 2000). Several studies have analyzed the influence of population on environment (UNICEF 1994; Sengendo 1997) but few have tried to analyze the linkages at city-wide scale. The complex nature of the urban environment and its interplay with population dynamics as mediated by urban development is the concern of this research. Current research on the linkages between population, urban development and environment advances significant relationships.

The conceptual model figure 2.1,shows relationships and linkages between the population dynamics urban development and how such relationships lead to environmental changes associated with wetland degradation, solid waste accumulation, water pollution, land use change and sanitation. Whereas the schematic representations may depict a linear relationship between population dynamics and urban development, a two way interaction continuously exists. These environmental changes now figure prominently both in development policy and research. The conceptual framework offers the opportunity for a coordinated assessment of the linkages and derivation of policy recommendations to design urban development policies that would improve the livelihood in urban areas and sustainable urban development in Uganda. Such an assessment will make a significant contribution to knowledge about the effects of population dynamics and urban development on the environment.

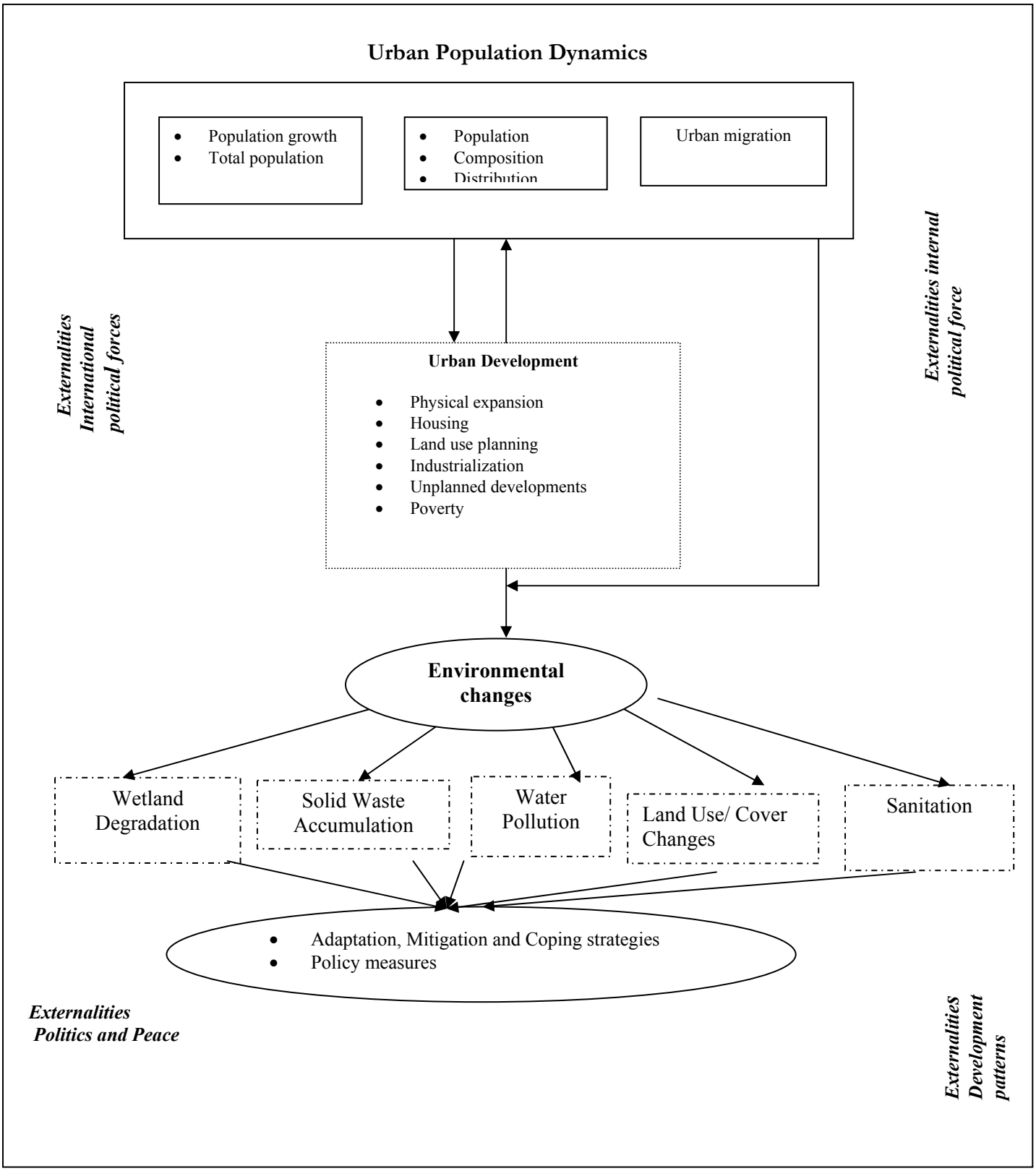


Fig. 2.1: Conceptual Model of the Study

CHAPTER THREE: RESEARCH METHODLOGY

3 Introduction

This chapter presents the research methodology which employed largely secondary data sources for synthesizing the interactions between population, development and environment. Additional methods were also utilized to analyze these relationships. The results presented are syntheses of data from secondary sources, statistical analyses and spatial analysis of the study variables.

3.1 Secondary Sources

Secondary data was collected from government documents, academic research reports, consultancy and newspaper reports. The documented information obtained from these sources included population data, planning frameworks industrialization activities, urban developments and environmental impacts. Secondary data was supplemented with primary data collected through interviews and discussion groups with relevant stakeholders. Statistical and qualitative analytical tools were used in analyzing these data.

3.2 GIS and RS data analysis

GIS was applied in spatial analysis of urban growth to get a characterization of how the city has been growing taking a period between 1980 and 2004. Remote sensing and satellite imagery formed the input for the urban growth analysis. Two satellite imagery of LandSat, one for 1980 (resolution of 20 m) and the second for 2001 (resolution of 20 m). Since the resolution is low for urban land use mapping, a classification of land use/cover was used(NFA 1996). After an examination of the imagery and digital signatures, nine classes of land use and land cover were derived as shown in the results. Industrial land use was isolated from the built up class because industrial areas exhibited significant differences in the DNS though in some areas this class was merging with built up. Additional knowledge of the area characteristics was captured through field reconnaissance surveys.

Imagery was classified using remote sensing technique of supervised classification. Enhancement of the satellite imagery was done first to remove noise and 'orphan' pixels with highly divergent values compared with the neighborhood pixels. After enhancement using filter operation of majority, the image was stretched to spread the DNS over a scale of 0 – 255. After performing a supervised classification, filtering was used to clean up the classified images in order to remove the unclassified pixels. Data was then input in the GIS for analysis of urban change. In the GIS environment, data capture and overlay techniques were applied for change analysis. Wetland outline boundaries were digitized from the two-satellite imagery and data used for analysis of the degradation of wetlands in Kampala. Statistical data was also derived from the digitized maps of wetlands and classified land use maps of the imagery.

3.3 Focus Group Discussions and Workshops

Results of the study were improved through FGD workshops with stakeholder who provided vital inputs. The final project report highlights the importance of urbanization in the national development process, but also provide awareness to policy makers and planners on issues of population change, urban development and environment. Urban planners can use such information when planning/demarcating land use zones while integrating population and environmental issues. The study recommendations and policy actions underscores the need for policy formulation on waste management and sanitation for a sustainable clean environment, low cost planned housing schemes for the urban poor and provisioning of safe water.

CHAPTER FOUR: POPULATION DYNAMICS

4.0 Introduction

Population dynamics play an important role in national and urban sustainable development. An increase in total population *citeris paribus* leads to an increase in the demand for goods and services and in turn an increase in demand for environmental resources. As noted earlier in the conceptual framework, population dynamics are the underlying drivers of environmental change in Kampala. The population variables of size, sex, age and migration are described and later linked to urban development and environmental changes.

4.1 Population Growth in Uganda

The population of Uganda has increased from 4.8 million in 1948 to 24.2million in 2002 (UBOS 2002) and it is estimated to have reached 27.4 million in 2006 and expected to double in 22 years. This population is unevenly distributed with 27%, 26%, 25% and 22% living in Central, Western, Eastern and Northern regions respectively. The growth rate vary between regions, the highest being Northern at ***2***.6% and lowest is Central at 2.7% giving a mean national growth rate of 3.***2***% p.a. and is projected to increase to 3.6% p.a in 2010. Uganda's population is generally young with 4***9***.3% under 15 years of age up from 47.3% in 1991 and 46.2% in 1969 (UBOS 2002).

The productive and reproductive age group 15 – 64 years decreased from 50% in 1969 to 47.7% in 2002 implying an increasing dependency ratio. The females exceed males by a sex ratio of 98.2 in 1980, 96.5 in 1999 and 95.3 in 2002 (UBOS 2002).

Infant mortality is high 122/1000 and 50% of the deaths are below the age of five (203/1000) while maternal mortality is 500/100,000 live births. There is high chronic malnutrition, high incidence of pregnancy related morbidity and mortality due to preventable causes including malnutrition, infectious diseases, haemorrhage, ***and*** malaria. Inadequate health care and supportive services especially in the rural areas where 89% of the population live is yet another problem facing Ugandan population (Uganda 1991). In urban areas, these characteristics do not differ significantly.

By 1991, Uganda had a high fertility rate of 7.1 children per woman but by 2002, it had declined to 6.9 (UBOS 2002). These high rates are due to low levels of education, early and universal marriage, low contraceptive use, early weaning, strong desire for children and high levels of poverty. Population distribution varies between districts and urban centers. Rural population density ranges between 301 (Kisoro) and 12 (Karamoja) per square kilometer and in Kampala; it is 4,600 while Jinja (which is the second largest urban center) is 430 people per square kilometer.

Migration and urbanization are responsible for population redistribution. The main causes of migration are political and economic in nature. The former is responsible for mass movement of refugees both internal and external and setting up of refugee camps. This has mainly affected Northern and Eastern Uganda. Urban growth (5.5% p.a) is responsible for 41% of the national urban population.

The high population growth trends constrain economic growth through high dependency levels 110%, low per capita GDP of US $250 in 2004, (Malaysia with same population at US $4,283) labour the productivity and per capita compared to income (US$ 285) and low per capita savings (World Bank 2006). It also increases unemployment and underemployment rates especially of the youth who are inadequately educated and untrained. Many have joined the ever expanding

informal sector where the aggregate productivity is low. This hampers efforts to reduce the population below the poverty line and the number of the poor is on the increase 8 million in 2000 and 10.4 million in 2006 (Uganda 2006). Proper population management is thus an essential element of public policy. The high population growth rates will also hamper government ability to provide sufficient and quality services (roads, schools, health services, water, electricity etc) due to inadequate funding. Natural resources like forests, wetlands, water, land etc will be degraded in search for cultivable land (Uganda 2006).

If the constraints are not addressed, sustainable and broad based economic development will be difficult to attain while natural resources will lose the capacity to support the population.

4.2 Population growth in Kampala

The population of Kampala like that of other urban centers in the country and the rest of the country has been on the increase. This has mainly been due to natural increase, high fertility, decline in mortality, internal and international migrations(UBOS 1991; UBOS 2002). Being a hub of economic, social, commercial, industrial and political activities that attract both internal and external migrants, Kampala has continued to be a primate city with a high population growth rate of 5.61% p.a. and 41.4% of the National urban population (Table 4.1).

Table 4.1: Kampala Population Trends and Projections 1969-2015

	1969	1980	1991	2002	2006	2010	20015
Total	330,700	458,503	774,241	1,208,544	1,479,741	1,811.794	2,400.000
Growth rate	-	3.2% pa	4.76% p.a	5.61% p.a	5.6% p.a.	5.6% p.a.	5.6% p.a.
National Urban Population	747,400	938,503	1,889,622	2,921,981	5,000,000	7,500,000	9,800,000
Kampala as % of National Urban Population	44.2%	48.85%	40.97%	41.36%	29.6%	24.2%	24.5%
National Urban Population Growth rate	13.73% p.a	2.56% p.a	10.13% p.a	5.46% p.a	17.8% p.a.	12.5% p.a.	6.1% p.a
National Population	9,535,051	12,636,179	16,671,705	24,200,000	27,400,000	32,900,000	39,300,000
Kampala % of National total Population	3.47%	3.63%	4.64%	4.89%	5.4%	5.51%.	6.11% p.a.

Source: National Population Census Reports 1969 – 2002 and Projections

Note:
Urban Population up to 1991 included all urban centers gazetted and ungazetted with a population of at least 1,000 people. During the 2002 census only gazetted urban centers were considered.

With data for 2002 Census as basis for modern variant assumptions the population is projected to reach 1.8 million by 2010 and 2.4 million by 2015.

Rapid population growth as experienced in Kampala could adversely affect economic development and poverty alleviation through depressive wages, reducing saving rates as more resources are spent on non-productive activities. This can be is explained by Vicious Circle Models (VCMs) which; seek to explain the linkages between high fertility, poverty, low status of women and environmental change (UNCEF 1994).

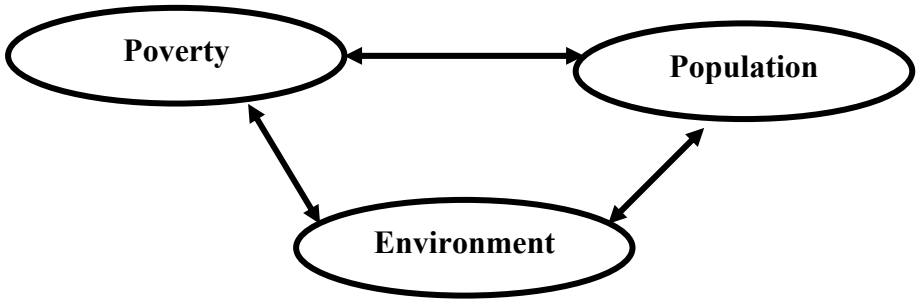
Rapid population growth makes it difficult for the urban authorities to meet the needs of the population for health, education, infrastructure, housing, water and sanitation and make it difficult to control environmental degradation.

The relationship between the household composition and natural resources and by extension its impact on the environment is mediated by natural, social, human and physical capital institutional and cultural factors (Sherbinin 2000, Fig. 4.1). This framework provides a starting point to analyze the relationship between population, development and the environment. This research borrows from the model to contextualize urban development environment relationships as driven by the population dynamics.

A population growth rate of 5.61% p.a. experienced in Kampala need to be matched by higher rates of economic development as to attain a steady improvement in the quality of life of individual families. Through increased development, households will be provided with the requisite social infrastructure of schools; medical, communication water, housing, electricity, security etc. Development will also increase employment opportunities and markets for the goods and services produced. However, the rapid population growth experienced in Kampala is a threat to the environment as natural resources like forests, water, land, wetlands etc, both in Kampala and the rural areas are degraded/over utilized in an effort to provide the basic human needs of food, clothing, shelter, security and health. The failure of development to match the rapid population growth has left poverty to continue biting the urban majority who have resorted to the environment for survival and this has made it difficult for urban authorities to enforce environmental regularities as political interference in favour of the poor prevail.

The rapid population if Kampala could stimulate development through provision of labour and market for the goods and services produced by the industrial and tertiary sectors. Unfortunately, the bulk of labour force is untrainable, unskilled and semiskilled and therefore unemployed and the few who are employed earn low wages/salaries. This makes them unable to consume the goods and services available on the market. Due to the low consumption rates, industries produce below capacity which makes production costs very high so that locally produced goods cannot compete favourably with imports. This has made Kampala a center of imported goods and Uganda a consumer economy which has contributed to the low rates of economic development.

Figure 4.1 Relationship between population, environment and poverty.



Source: UNICEF (1994) State of the World's Children

4.3 Spatial and Age – Sex distribution

The population of Kampala is not evenly distributed among the five administrative units (divisions). This is mainly due to: - variation in level of economic development, availability of

residential space, distance to the town center and distribution of social infrastructure. While Rubaga and Makindye are dominated by residential facilities, Nakawa is dominated by industrial establishments and Central is the commercial hurb. Kawempe has a number of industries, commercial establishments and residential facilities. These land use activities influence population distribution. Rubaga and Makindye have high population as most of the land is put to residential use and Central Division, which is the smallest and is dominated by commercial activities has the lowest population. Nakawa with many industries, which need a lot of space, also has low population totals Table 4.2. The population is dominated by children under 18 years (44.9%), a few above 60 years (1.7%). The active group 18 – 60 years (53.5%) is dominated by the youth (18 – 30 years (34.9%) (UBOS 2002).

Table 4. 2 Population Distribution by Division and Sex

Division	1969		1980		1991		2002	
	M	**F**	**M**	**F**	**M**	**F**	**M**	**F**
Rubaga	39,728	343,70	49,576	54,270	85,767	93,561	143,742	158,363
Kawempe	34,284	25,975	41,570	41,315	76,805	84,511	128,624	140,035
Nakawa	36,049	23,662	44,166	37,747	67,709	66,104	122,712	123,586
Makindye	44,78	35,677	57,016	56,288	91,463	95,534	147,732	153,358
Central	33,140	23,028	39,887	36,768	55,481	57,306	45,623	44,769
Total	**187,988**	**142,712**	**232,215**	**226,288**	**377,225**	**397,016**	**588,433**	**620,111**
Grand Total	**330,700**		**458,503**		**774,241**		**1,208,544**	

Source: National Population Census Reports

4.4 Ethnicity and Cultural background

Kampala as a capital city is a focal point of human settlement and meeting point of people from different ethnic and cultural backgrounds. 60% of the indigenous Ugandan population are Baganda and 5% Banyankole and other tribes contribute the remaining 35% (Kampala 1995 – Appendix I). Foreigners constitute 2% of the population. Rwandese constitute the largest foreign group 21%, Tanzanians 19%, Kenyans, Burundians, Zairois and Asians (Kampala 1995 – Appendix I). The European, Chinese, Japanese and American population is also increasing due to the expanding private sector, NGO's, diplomatic staff and tourism.

4.5 Urban migration

Kampala attracts both national and international migrants due to its status and strategic functions as the national capital and industrial center. However, Kampala also loses population through emigration to its peri-urban zone, other parts of the country and/or the diaspora. Migrants are both temporary and permanent and that's why its resident population is almost half of the day population(KCC 1997; UBOS 2002; KCC 2003). Kampala is the focus of social, economic and industrial establishments. This has attracted migrants both internal and international in search of employment and investment opportunities The internal migrants mainly invest in trade which range from informal petty trade to international trade. The urge for trade space has sparked off the growth of the construction industry (shopping arcades, super markets, etc) and roadside open markets.

Due to a small modern sector, the demand for jobs always exceed the supply. This has forced many job seekers to try their luck in the rapidly expanding informal sector (production and services delivery) as evidenced by the numerous roadside activities, markets and hawkers. International investor activities include trade, industries, hotels; shopping complexes (Garden City and Game Shoprite). The increasing number of educational institutions of all categories/levels also adding to the population especially the youth who on completion/drop out of their studies prefer to seek for employment in Kampala. The number of international students from the neighbouring countries is also on the increase. The peace prevailing in most parts of the country has attracted migrants to Kampala just as insecurity and displacement in Northern and North Eastern Uganda. An increasing number of Karamajong women and children roam the streets of Kampala as beggars. The Non-Ugandans found in Kampala originate from different countries but mainly from the neighbouring countries (Table 4.3).

Table 4.3 Non-Ugandan immigrants to Kampala 1969 - 2002

	1969	**1980**	**1991**	**2002**
Non-African	164	255	6,508	15,320
Kenya	34,420	1,100	1,318	8,210
Tanzania	5,234	201	371	1,115
Rwanda	5,349	215	331	3,080
Burundi	847	89	134	910
Zaire (DRC)	3,348	210	343	1,101
Other Africans	2,836	417	547	2,923
Total	**52,198**	**2,487**	**9,814**	**32,659**

Source: National Population Census Reports

Table 4.4. Migration trends in Kampala 1969 - 2002

Year	**Born in Kampala**	**From Buganda**	**Outside Buganda**	Outside Uganda		**Born in Kampala Found else where**	**Total**
				African	**Non-African**		
1969	74,031	159,521	44,950	52,034	164	78,326	**330,700**
1980	208,147	180,333	67,536	2,232	255	187,000	**458,503**
1991	316,190	254,625	183,085	13,833	6,508	205,810	**774,241**
2002	569,575	327,222	285,088	17,339	15,320	340,170	**1,208,544**

Source: Computed from National Population Census Reports

It is evident from Table 4.4 that the majority of internal migrants to Kampala come from the Central region (Buganda) due to proximity and ease of movement. Migrants from outside Buganda and Uganda are also on the increase especially after 1986 when peace and political sanity returned to most of Uganda and economic liberalization, which has attracted both internal and external investors. Migration has contributed to population growth, which in turn has led to an increase in demand for land both for settlement (housing) and establishment of commercial, industrial, social and informal activities. This demand has changed the spatial distribution of activities in the city.

CHAPTER FIVE: DEVELOPMENT OF KAMPALA

5.0 Introduction

Urbanization, which is a recent phenomenon in Third World countries, is not determined by revolutionary changes (Brockerhoff 2000). Instead it is a gradual process cumulatively dependent on the use of land as well as flow of goods and services. As observed by Pareto (UNDP 2005) efficiency or optimality—one of the core ideas of modern economics—declares that only a change that leaves nobody worse off can be declared "welfare enhancing"/"development". Though urban development in Kampala indicates growth in economic activity, housing and infrastructure investments; it is leaving many worse off due to polarization of poverty. In this chapter, the process of Kampala's development is described by focusing on physical expansion, land use planning, housing, unplanned developments, industrial development and poverty.

5.1 Physical expansion of Kampala

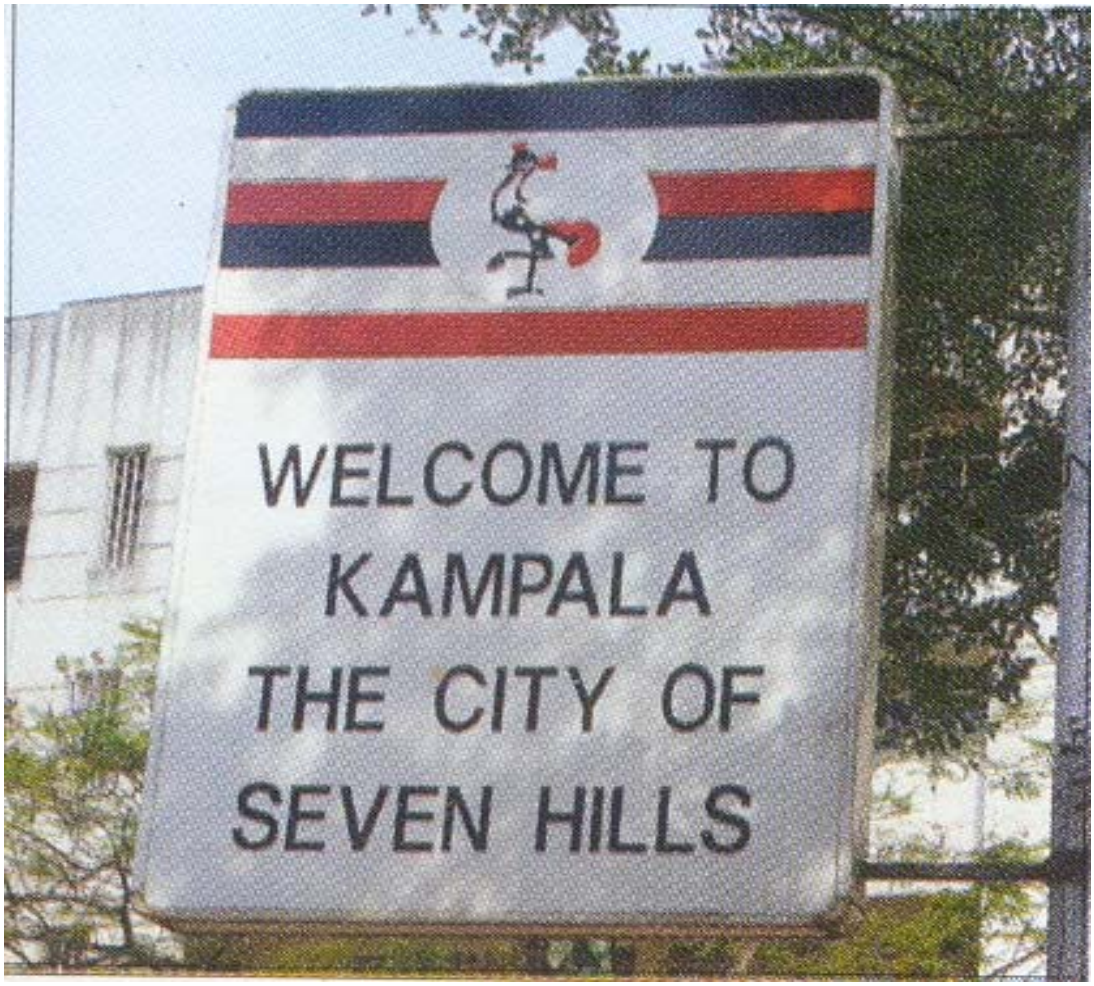
Kampala fondly known as the "green city in the sun", is the only urban district in Uganda. It has evolved from a small hamlet occupying 8 sq. km in 1906 to "city of seven hills" at independence in 1962 (Fig 5.1) and (2006) one of the fastest growing cities in Africa occupying more than twenty five hills (Kibirige 2006) Map 5.1. The hills have relatively steep slopes separated by wide valleys. The city derives its name from the land of "Impala" (antelope) that roamed the area before it was taken over for human settlement. The first administrative post was set up at Old Kampala hill by Lord Lugard (British administrator) in 1890. By 1902 it covered an area of approximately 0.68sq km centered at Old Kampala hill and in 1905 it was transferred to Nakasero hill and in 1906 it was gazetted a town council with an area of 8 sq km. By 1928 the town council covered an area of 12.8 sq km which expanded to 25.6 sq km by 1944 and 195 sq km by 1968 (Map 5.1). Despite the increase in developments and population the city boundaries have not been extended since 1968. However some of the urban population is now shifting to Kansagati, Nansana, Kyengera, Kira, Kajjansi , Wakiso and Maganjo, Kawanda which are in Wakiso district but satellite to Kampala (Map 5.2).

To the South of the city is Lake Victoria the world's second largest fresh water lake and source of the longest river in the world, the River Nile. The Original seven hills of Kampala are Old Kampala,Nakasero, Mengo, Rubaga, Namirembe, Kololo and Makerere (Map 5.1). Each of these hills has played a different role in the growth and development of Kampala.

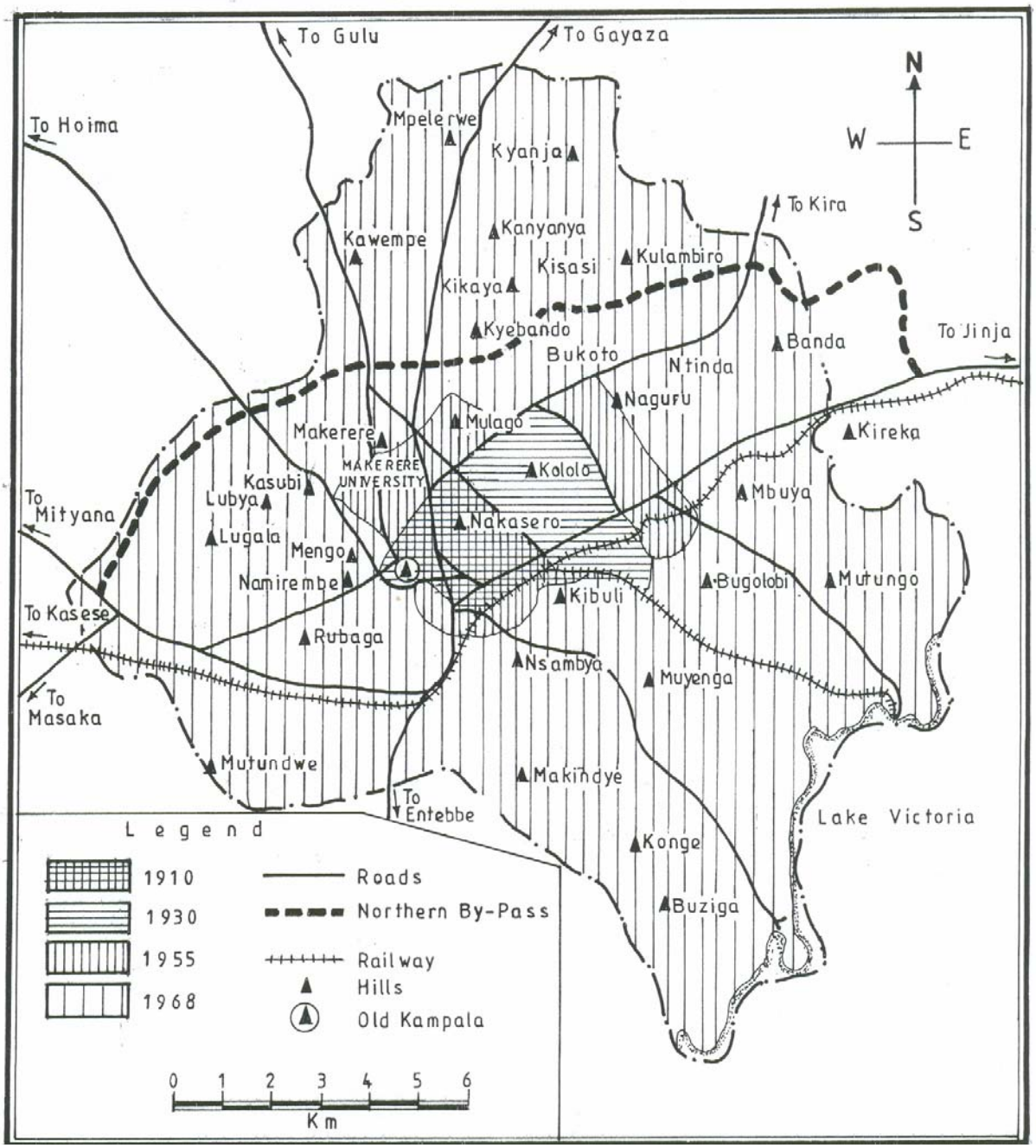
- Old Kampala : First administrative post (Fort Lugard) Headquarter of Islam.
- Mengo : Headquarter of Buganda Kingdom with largest Manmade lake – Kabaka's lake.
- Namirembe : Seat of the Anglican Church (COU) till 1960s now seat of Namirembe Diocese (COU)
- Rubaga : Seat of Buganda Government till Mutesa I's reign Seat of Catholic Church.
- Nakasero : Colonial Administration Headquarter, UN 1905. Heart of City, State house, hotels many embassies, Residence of the elite.

- Kololo : Colonial prison (Summit View Military Barracks) Residue for colonial officers, best planned area with an Airstrip and Golf course.
- Makerere : The 'Fountain of Knowledge' with the first largest public university set up 1922.

Plate 5.1: A Sign Post in City Centre in 1962

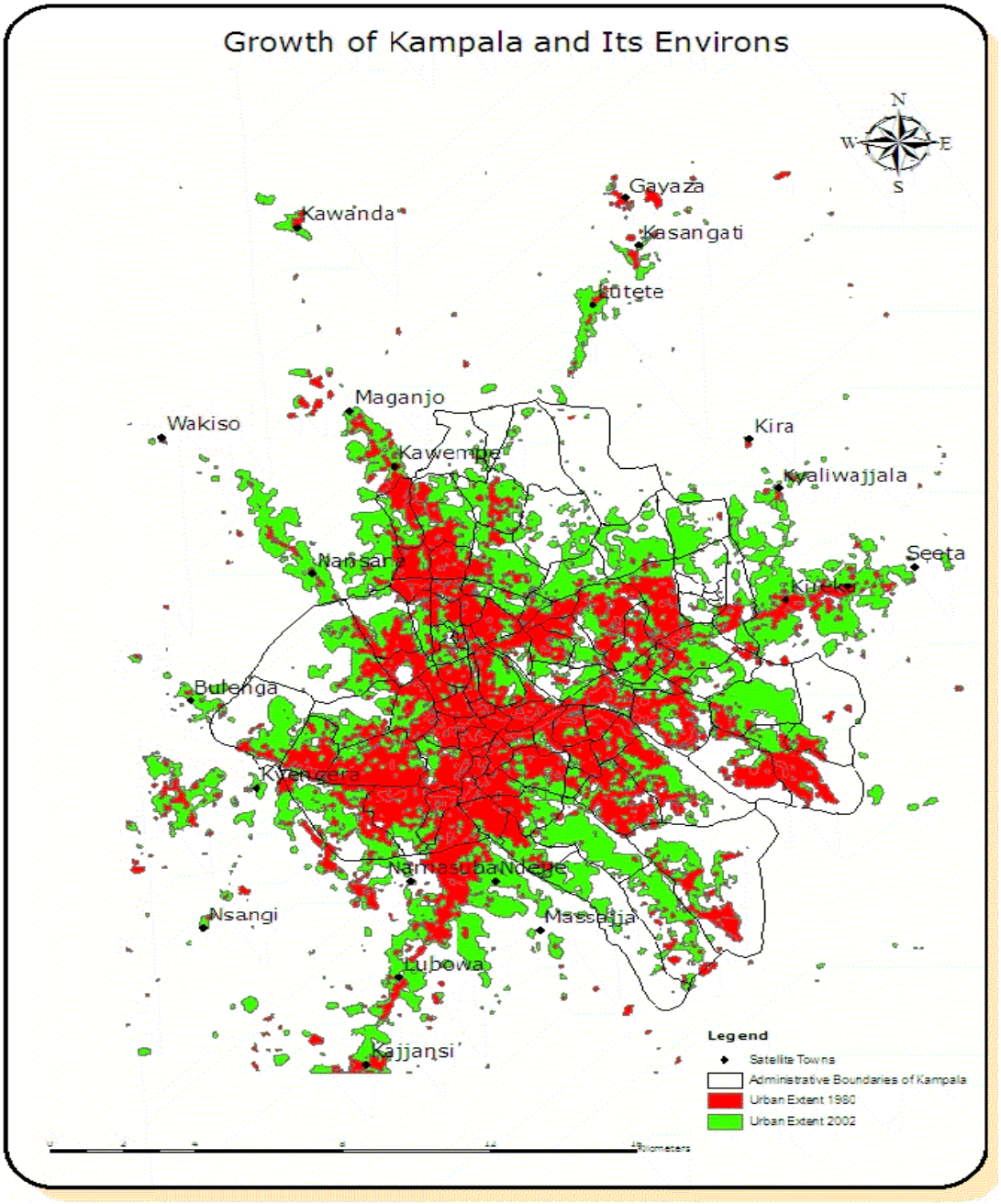


Map 5.1: Physical Expansion of Kampala



Source: Uganda Atlas 1998 and Kibirige (2006).

Map 5.2 Growth of Kampala and its Environs 1980 – 2001



Source: Generated from satellite images of 1980 and 2001 (resolution 20 m)

5.2 Land Use Planning

As Kampala was experiencing physical expansion, land use patterns "guided" by the urban planning process also changed. The principal land use activities include; settlement, industrial, commercial, open spaces, wetlands and agriculture. Settlement patterns seem to be dictated by certain factors the main important ones being income and tenure system. The nature of land tenure in Kampala customary, freehold, mailo and leasehold has influenced and determined the planning, development and control of urban settlements. For example the land held under leasehold has been easier to plan. However, mailo (private) land tenure which accounts for 65% of the city area and about 80% of the area covered by informal settlements permits perpetual private ownership of large chunks of land irrespective of whether it is developed or not. This

tenure system has also been favourable to subdivisions and intensified land market. Due to these factors, this category of land tenure lends itself less to urban planning and therefore is rarely provided with infrastructure facilities. The dual system of tenure rules limit the urban authorities in making innovations and enforcing any clear urban development plans. Land use pattens at different times have been "guided" by planning schemes (Appendix II – VI).

5.2.1 Kampala's Planning Schemes

Planning is vital for sustainable urban development and Kampala as the capital city and largest urban center in Uganda has been planning for the development of the city. The planning of Kampala is traced from the time shortly after signing of the Uganda Agreement in 1902. This is because trading interests were such as to make it imperative for government to find a more suitable site than the fort area in Old Kampala for trading purposes(Kendall 1955). By 1903 freehold plots, or temporary licenses, or leases of up to 99 years were made available on crown land to the traders across Nakivubo valley as an encouragement to set up businesses (Kendall 1955). By 1915, an Indian bazaar and commercial area of the town had been established at Old Kampala. But the need for planning became apparent in order to address the pressing issues of and a necessity of securing the town's development on health lines; water supply; drainage of the marshes; compulsory disinfection and managing plagues.

It is important to note as early as 1912, drainage of swamps was one of the prioritized activities. This activity had and still maintains implications to environmental degradation and crowding in Kampala. The allocation of plots in Nakivubo set a precedent of development in wetlands within Kampala as early as 1912 (Appendix II). By 1918, a planning board was established and standards for plot sizes and coverage set. Guidance of developments in Kampala continued provided by the planning board but in spite of the time spent on the matters, there was no master plan produced and or adopted. Plans were developed in 1919, 1930, 1972 and 1994 as shown in appendices (III, IV, V, VI, VII). But despite of all these efforts, slum conditions and environmental degradation have continued to develop in Kampala. Although the schemes prepared allocated land in wetlands to commercial and industrial use, the continued segregation of the *Kibuga* in planning activities had a profound impact on the developments in wetland areas. While the *Kibuga* remained out of the municipality, this segregation and separation of roles by the municipality further increased opportunities for haphazard developments many of which were undertaken in wetlands. Although there were reserved sites for forests and mainly in valleys, general environmental concern was not reflected in the scheme.

On the other hand the 1972 planning scheme had an elaborate strategy for industrial development and employment policies. Zoning for industrial areas was done on sites including; Nakivubo stretch, Nabisasiro, Natete-Ndeeba, Ntinda area, Kinawataka and outside Kampala. All these sites stretch into and completely within wetlands. A total of 1678 hectares were allocated for industrial use mainly because of the then existing good transportation links, closeness of industrial areas to high density residential areas, deconcentration of industrial activity in Kampala and perhaps importantly the flatness of land for the industry.

The preparation of the 1994 structure plan largely borrowed from the experiences of the past schemes and the increasing calls for integration of environmental issues in planning. The procedures during its preparation involved a wide and comprehensive approach in terms of sector and stakeholder involvement. The Kampala Urban Study which preceded the structure plan preparation exemplifies the change in procedure(Nostrand 1993; Norstrand, Development et al. 1994). Inclusion of environmental issues and the general model of Gentrification, which was proposed meant a rethinking about Kampala as a dense, centrally but adequately serviced city to ensure convenience and orderly development. The implication of these developments is

manifested in the current imprint of spontaneous developments even when such developments are medium to high values houses. Coupled with the dynamic land market in Kampala, land subdivision and eventual development has continued almost unabated with less than 30% of development plans being approved (Pareto 2004). Other sectors were also well covered and proposals made but housing and Industrial related activities took a big proportion of the land allocations and therefore have a profound influence on the environment.

5.3 Housing Development in Kampala

The rapid population growth of Kampala (5.6% p.a.) has increased the demand for housing for all income groups especially the low income group. The Istanbul Declaration of which Uganda subscribes and Millennium Development Goal 7 Target 11 emphasise the need to make human settlements healthier, safer and more livable, sustainable, equitable and productive. It is therefore important for all residents in Kampala to have a decent living environment, clean water, sanitation, transport electricity and other services. Because of this demand, housing facilities in Kampala have been increasing in quantity. In 2006, Kampala needed 302,136 housing units in addition to the existing 251,780 units; of which 25,178 needed replacement and 50,356 renovation (Nsambu 2006). This means homelessness still prevail in Kampala as the demand for housing exceed the to supply. However, the Uganda Government has facilitated macro-economic stability, economic liberalization, security, infrastructural development, constitutional land tenure reform which have greatly improved the performance of the sector. Several real estate developers e.g. Akright Projects Ltd; National Housing and Construction Cooperation Ltd. (NHCCL) and Blue Ocean Developers have been setting up modern housing estates.

Under the Condominium Property Act. 2001 NHCCL has sold over 200 flats and plants to sell another 1,300 in Kampala to sitting tenants. It has set up estates in Bukoto, Ntinda and Lubowa while Akright Projects Ltd established in 1999 has established ten housing estates in Kampala with a housing capacity of 2,937 units for different income categories. These housing estates are located on the different hills that make up Kampala. Habitat for humanity an NGO based on charity is also involved in housing construction for needy families both in the rural and urban areas.

The government has been involved in slum upgrading projects e.g. Namuwongo project which aim at improving the living conditions for the slum residents. The private sector is involved through construction of personal residential houses, rented commercial and residential houses. Through private sector participation high rise buildings have been put up for both commercial and residential purposes.

The skyline around educational institutions especially universities is changing through construction of storied residential hostels for the increasing university student population. For instance, Katanga, Kikoni, Kagugube, Kivulu slums, around Makerere University have given way to high rise hostel buildings. The Central Business District of Kampala (CBD) has been transformed through the construction of new shopping arcades, hotels, apartments, office blocks, modifying and renovating the old buildings. Outside the CBD high rise commercial and residential buildings are on the increase.

Slums which used to be found close to the CBD are disappearing very fast but are re-emerging at the periphery as slums continue to house the majority of the urban population (Nsambu, 2006). Though the private sector is very active in the housing sector, most of their activities are informal with no direct government support. The developers try to by-pass bureaucratic official planning, building regulations and standards and the complex/costly procedures. The high levels

of informal housing indicate that the informal land and housing markets do not provide affordable land and housing, forcing households to occupy land informally and sometimes illegally and developing it illegally leading to insecure tenure. These settlements have high densities, few proper roads and other urban infrastructure and do not and namely conform to existing planning and building regulations. The informal sector has no access to formal housing finance mechanisms. The informal construction industry is not capable of meeting the ever increasing demand for housing. Housing production capacity in Kampala, and Uganda in general is limited and poorly organized and the demand will continue to exceed the supply and this has negative implications for urban development and environment (Uganda 2005).

5.4 Unplanned Developments

Despite the existence of planning schemes as discussed in section 5.2.1 Kampala city continues to experience unplanned developments where activities such as residential housing, commercial and industrial use are located outside the planned areas. This study considered unplanned housing as the major/visible land use, which affects development. The impact of the eroded economic condition of the country on housing is the present situation of gross inadequacy of housing supply**. T**here has been a general increase in housing stock in the last fifteen years especially in urban areas and Kampala in particular. Although the existing housing stock continue to deteriorate, due to lack of proper maintenance. This has contributed to the general shortage of housing. Urban dwellers mostly of low-income levels are faced with the problem of locating and acquiring suitable, affordable and satisfactory accommodation provided with social amenities. Scarcity of habitable shelter has assumed staggering dimensions, as occupancy rate is about 1.3 indicating a backlog of 30%.

The supply of housing for the low-income households has not kept pace with the urban growth and the needs of the people. Comparing population of 1991 and 2002, it can be deduced that an estimated 203,000 new households requiring housing exist in Kampala. Given that migration plays an important role, many of the new comers are in zones of transition and would require more decent housing due to the inadequacy of informal housing. The most common housing unit in the city is the tenement ("*muzigo*") occupied by 53.5% of the population(Sengendo 1997; UBOS 2002). The tenements are always not more than 2 rooms with the majority as single rooms. They are usually constructed without adequate sanitation and drainage and usually in inappropriate areas such as wetlands that are prone to flooding (Plates 5.1, 5.2, 5.3 and 5.4). Since the 1990s, Kampala has been experiencing rapid unplanned housing construction. Many of the houses especially those constructed by low-income people are near drainage channels with no latrines and bathrooms. According to UPPAP (2000), about 30% of Kampala's population live in informal settlements commonly known as slums which cover about 10% of the total area of Kampala with an average density of 14,112 people per square kilometer. Unfortunately both the number of slum dwellers and the area covered are on the increase and this is posing an environmental and planning challenge for the urban authorities. This has resulted from failure to enforce strict urban planning regulations that has made the city a freelance specter for all sorts of illegal "developments" (Nawangwe and Nuwagaba 2002).

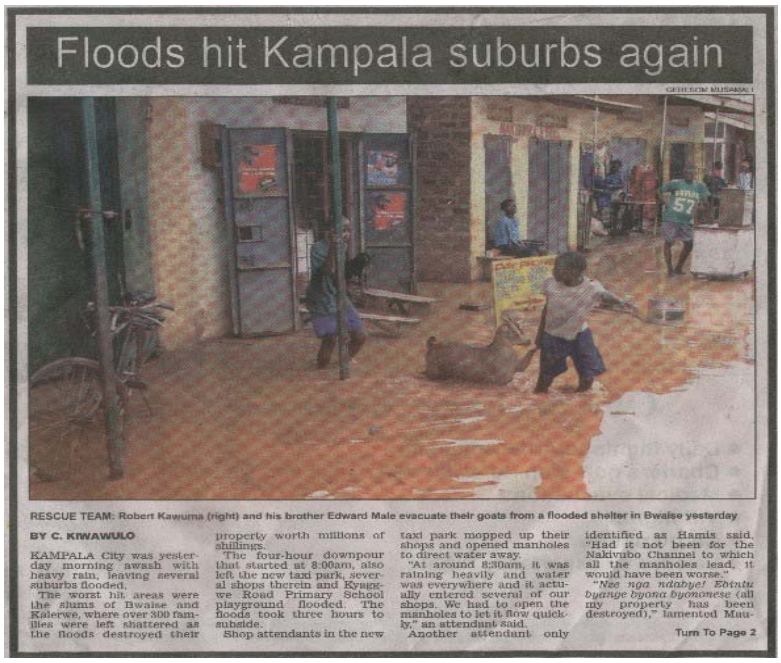
Therefore, a walk through a typical Kampala slum area exhibits all the symptoms of an informal settlement. It should be pointed out that in spite of the physical planning by-laws and regulations that have been in place for a long time, it has not shaped the people's living environment.

The living environment of the urban poor is characterized by the following conditions;

- Latrines are built in front of other peoples' compounds.
- Children play near latrines some of which are leaking and thus vulnerable to diseases.

- Houses are dump because they are constructed in water logged areas.
- Developments are retarded as it is not possible to carry out road construction since houses are constructed in road reserves making the areas inaccessible.
- There is increase in water borne diseases like cholera.
- It is difficult to access latrines for emptying due to lack of proper road networks in informal neighbourhoods.
- Drainage channels and pit latrines are a source of contamination of spring/underground water sources.

Plate 5.2: A flooded housing Estate constructed in a wetland



Floods hit Kampala suburbs again

RESCUE TEAM: Robert Kawuma (right) and his brother Edward Male evacuate their goats from a flooded shelter in Bwaise yesterday

BY C. KIWAWULO

KAMPALA City was yesterday morning awash with heavy rain, leaving several suburbs flooded.

The worst hit areas were the slums of Bwaise and Kalerwe, where over 300 families were left shattered as the floods destroyed their property worth millions of shillings.

The four-hour downpour that started at 2:00am, also left the new taxi park, several shops therein and Kyagwe Road Primary School playground flooded. The floods took three hours to subside.

Shop attendants in the new taxi park mopped up their shops and opened manholes to direct water away.

"At around 6:30am, it was raining heavily and water was everywhere and it actually entered several of our shops. We had to open the manholes to let it flow quickly," an attendant said.

Another attendant only identified as Hamis said, "Had it not been for the Nakivubo Channel to which all the manholes lead, it would have been worse."

"*Nze nga ndabye! Ebintu byange byona byonnese* (all my property has been destroyed)," lamented Mutu-

Turn To Page 2

Plate 5.3: A young boy trying to walk a Goat across the flood

Floods bring Bwaise businesses to a standstill

RONNIE KIJJAMBU

HEALTH HAZZARD: Garbage piled up at Nsoobe River, intensifying the flooding problem at Bwaise in Kampala yesterday

By Christopher Khwanulo

BODABODA cyclists took advantage of the flooded Bwaise roads to make extra money yesterday.

The cyclists operating on Mambule Road which connects Bombo Road to Gayaza Road, hiked transport fares from sh200 to sh500 and sh500 to sh1,000 for bicycle riders and motorcyclists.

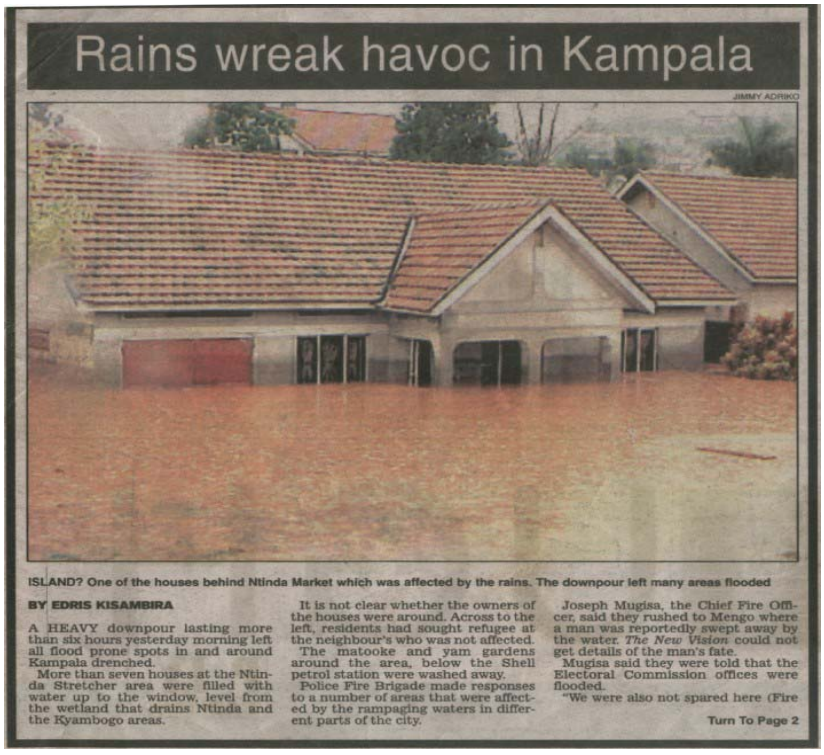
About 200 houses in Bwaise including the zone four National Water and Sewerage Corporation offices, were difficult to access after an overnight downpour.

James Wasswa, one of the cyclists told *The New Vision* that he had by 11:00am earned himself sh10,000 adding that, "I think this is luck from God ahead of the forthcoming Christmas season, because I rarely make such money by this time."

Patients from Dr. A.K Lubega's clinic were being transported on bicycles to the main road as water from the Nsoobe River spilled over the road.

Bustnesses were also paralysed as water had entered and flooded the shops.

Plate 5.4: Solid waste transported by a flood in a residential area



Rains wreak havoc in Kampala

JIMMY ADRIKO

ISLAND? One of the houses behind Ntinda Market which was affected by the rains. The downpour left many areas flooded

BY EDRIS KISAMBIRA

A HEAVY downpour lasting more than six hours yesterday morning left all flood prone spots in and around Kampala drenched.

More than seven houses at the Ntinda Stretcher area were filled with water up to the window, level from the wetland that drains Ntinda and the Kyambogo areas.

It is not clear whether the owners of the houses were around. Across to the left, residents had sought refugee at the neighbour's who was not affected.

The matooke and yam gardens around the area, below the Shell petrol station were washed away.

Police Fire Brigade made responses to a number of areas that were affected by the rampaging waters in different parts of the city.

Joseph Mugisa, the Chief Fire Officer, said they rushed to Mengo where a man was reportedly swept away by the water. *The New Vision* could not get details of the man's fate.

Mugisa said they were told that the Electoral Commission offices were flooded.

"We were also not spared here (Fire

Turn To Page 2

Plate 5.5: High class residential housing in a wetland under floods

5.5 Industrialization in Kampala

Drawing from the history of planning and particularly the zoning of industrial estates in and or around wetlands, industrialization over time has contributed to the influx of migrants into the city. The population of the city has grown geometrically as analyzed in the earlier section but the daytime population more than doubles the resident population. Although there are several reasons for the daytime population, the influence of industries and markets as major employers needs to be recognized.

Urbanization due to industrialization in developing cities is far from the norm but it is equally difficult to conclude that urbanization is occurring without industrialization in Kampala. (MoFEP 1995; Byandala 1996; Lwasa 2004) indicate that industrialization has increased in Kampala largely due to the liberalization investment policy and other macro-economic policies. Kampala and the surrounding areas have thus attracted industrial investments due to a general existence of infrastructure for industrialization and government policy of establishment of an industrial estate in the degazetted forest of Namanve. This has turned Kampala to an industrial capital of Uganda.

Practically all Kampala's markets attract a range of informal artisanal industries, which are located either within, or around them. The formal industrial areas include Ntinda, Nakawa, Luzira-Port Bell, Kawempe and Namanve. These industrial areas accommodate 93% of Uganda's formal industries and employ 66% of Uganda's industrial labour force (UMA, 1989). Since 1991, Uganda Investment Authority (UIA) has licensed a total of 1,561 industrial businesses of more than 15 categories including manufacturing, advertisement, leather tanning, food processing, beverage companies and industries dealing in petrol-chemical products. Out of the total, 424 were implemented and 448 non-implemented while 689 are operational. These industries range from wet (imply use and generation of liquid inputs and outputs), dry (non-liquid inputs and outputs) and service industries and are of differing sizes in terms of production output and human resource.

The numerous small-scale industries are involved in food processing, metal fabrication wood works, wine and soft drinks. These industries are contributing to the migration into the city due to employment opportunities, which also involves absorption of exported excess fertility from rural areas. They are contributing to direct and indirect employment. A total of 1,500 planned employment opportunities were expected to be generated by the licensed industries (UIA 2005). This level of employment generation implies better opportunities for the labor in Kampala, which acts as an attraction for more migrants, that exceed the available opportunities. On the other hand, the planned employment opportunities are too few to absorb the labor and coupled with increasing population, this creates an excess influx of laborers. Direct in the context of opportunities to work in the industry and indirect in terms of opportunities for trading in products due to forward and backward linkages with other economic activities. Though growth in industrial activity indicates development opportunities, it has had serious environmental consequences including wetland degradation, deposition of solid and toxic wastes in the wetlands and drainage channels.

5.6 Poverty in Kampala

As Uganda is increasing becoming urbanized, there is also an increase in the urban poor. Urban poverty incorporates both income levels and lack of access to decent shelter, basic services and infrastructure.

More than 60% of Kampala's population live in informal settlements scattered around the city where 43% of the population is not able to meet the basics of life, due to poverty (KCC 2003). Although poverty in Uganda has a " rural face" the urban poor in Kampala are much more disadvantaged, since they live in very poor and shanty housing conditions and lack access to supportive social networks (KCC 2003). The income level of the inhabitants is generally very low. The urban poor, unlike the rural poor, are the most vulnerable group as the government does not provide any social safety nets for them. The current poverty indicator of less than one dollar a day does not take into account the increased costs of living in urban areas and the difficulty of living outside the cash economy. The poor residents of Kampala wake up in insecure substandard houses, facing an uncertain day and future. Children are born into lives where clean water and health diets are unknown and attending school is a dream beyond the reach of many despite the free primary education. Economic deprivation puts family life/individuals under pressure and drugs, drinking and gambling offer tempting, but temporary escape routes for some especially the males while females take to prostitution, begging and as street kids. This is a big challenge to Kampala City Administrators.

Most people working in the informal sector identify themselves as self-employed or business women/men. They have an income, which can fluctuate a great deal between different periods of time, even between days. The fact that most of the people live "from hand to mouth" is something that makes it impossible for the inhabitants to enter into agreements and arrangements that make assumptions about future income levels, like having a service that is regularly billed. The billing arrangements for service of water supply and electricity for example that are suitable for low income settlement is one where the service is accessible when the self employed have money, and not on a monthly basis or so. As observed by (ILRI and CBS 2002) in their spatial analysis of poverty, Kampala has several 'poverty hot spots' dotted around in the city's high density low-income settlements.

Poverty in Kampala need to be addressed sooner than later, by increasingly devolving the responsibility to the local government (KCC) as this will help to meet international poverty reduction goals(Uganda 2005). Kampala City Council should prepare pro-poor urban development strategies and action plans. The focus of such strategies should be on policies and actions that have a direct impact on improving the living standards of the poor. The inclusion of poverty reduction measures as a requirement for LGDP funds is a good trend. The challenge is on the use of the funds for the purpose it is meant for.

CHAPTER SIX : ENVIRONMENTAL CHANGES IN KAMPALA

6.0 Introduction

The interactions between population and urban development in Kampala have manifested positive and negative environment at changes. The magnitude of the changes are influenced by the level of urban development planning and implementation of the plans as intervening factors. Where planning is visible, there is a tendency for balance between urban development and environment. Whereas in areas of spontaneous developments, the environmental changes are adverse and may be irreversible.

6.1 Solid Waste Accumulation

Kampala like many other major cities in the developing countries is faced with rapid urbanization and coupled with the coping (survival) strategies are excessively straining the existing socio-economic facilities and under-investment in new ones. Education, health, water and sanitation facilities are the most affected. One of the environmental consequences of rapid urbanization that has remains a serious challenge for urban management is the amount of solid waste that is generated. The solid wastes generated in Kampala are from diverse sources that include;

- Domestic
- Commercial activities
- Industrial activities
- Hospital, Clinics, Maternity Centres
- Offices
- Building Contractors
- Schools and Colleges

Kampala generates an estimated 30,000 tones of waste per month, with a composition of vegetable matter at 73.8%, paper 5.4%, saw dust 1.7%, plastic 1.6% metals 3.1% , glass and porcelain 0.9%, tree cutting wood 0.7%, miscellaneous 5.5% (ERL 1990, KCC 1995 and NEMA 1996). The average per capita solid waste generation rate is 0.6-kg/per person/per day with a high organic content and bulky density (Ngategize, et al 2000, Table 6.1 and Figure 6.1). However there are varying percapita generation rates depending on income levels Table 6.1. Obviously high-income households generate MORE wastes than low income households but accumulation is higher in low income areas compared to high income settlements due to an availability of waste collection services.

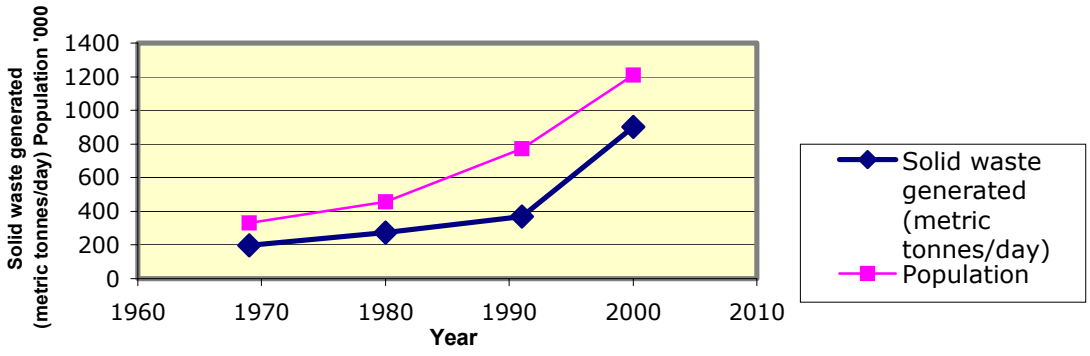
Table 6.1: Domestic waste generated in Kampala

Area	**Estimated Population**	**Per capita Waste**	**Daily waste**	**Annual total in (tons)**
High income	5.3%	0.6 kg	27.62(15.9)	10.081
Medium Income	16.8%	0.3kg	43.78 (25.3%	15.980
Low income	77.9%	0.15kg	101.50	37.041
Total	**100%**		**172.9(58.7%**	**63.103**

Source: *Tropical Development Co. Ltd. A feasibility study for organic fertilizer project in Uganda, 1991>*

Note: *As population increases, the amount produced especially for the low income sector also increases.*

Figure 6.1 Estimated daily solid waste generation rate for Kampala City 1969 - 2000



Source: Kampala City Council, 2000

Solid waste management is one of the serious problems in Kampala that has undermined the council's capacity for proper management and efficient disposal (KCC 1998). Kampala like other urban centers in the country and developing countries in general enjoyed the urban administration monopolistic statutory requirement of collection, storage and disposal of waste (KCC 1995, Uganda 1964). Kampala City Council (KCC) used to handle (collection, storage, disposal) all wastes within its jurisdiction. This required a total of 3244 skips to effectively collect the solid waste generated. Unfortunately by 1995 there were only 470 functional skips which over time have been reducing due to none replacement. Until recently when waste collection was privatized, KCC through its Engineering department was supposed to empty the skips on a schedule that included; daily emptying for the markets, twice a week for high incoming residential areas and weekly for other places. However, this schedule was not adhered to leading to accumulation and skips overflowing of garbage and emergence of illegal dumping sites (Plates 6.1 and 6.2). The overflow of skips occurred due to poor dumping and carelessness by users (NEMA 1998). With a deficit of 2774 skips KCC had a problem of handling the solid waste generated. Not only were the skips inadequate, KCC also lacked enough specialized equipment like tippers, wheel loaders, backhoe loader, bulldozers, excavator, trucks, and rollers used for handling waste. Realizing the daunting challenge of keeping the city free of accumulating rotting garbage, KCC embarked on a policy reform to revise the solid waste management ordinances. In 2004 the private sector got involved in collection and transportation of wastes to the landfill. In the initial stages of implementation, KCC subsidized for residents of low income settlements to allow payment of 1,500/= per emptying for a household based on door-to-door services. To-date KCC is only remaining with disposal while collection and transportation is fully privatized and households pay between 10,000/= - 15,000/= per month for door – to – door emptying of their waste storage facilities.

Plate 6.1: **An overflowing City Council Skip in Wandegeya next to Makerere University 2004**

Plate 6.2a: **Accumulated Solid Waste in a settled area: a result of irregular collection**

Plate 6.2b: Site in 6.2a above reclaimed for business in 2006

Important in solid waste management is lack of community sensitization and programmes to utilize some wastes for useful purposes. Indiscriminate dumping still exist especially in high density residential areas creating unsightly and unhealthy conditions potential for multiplication of disease carrying vectors especially mosquitoes (Lwasa 1999). When it rains, the leachate and wastes are washed to water sources used for domestic purposes. It is no wonder that over 90% of the protected springs in Kampala have water unfit for human consumption due to contaminate (KCC 2003). However, in the absence of other sources of domestic water the population is forced to use the contaminated water, which is a source of water related diseases (KCC 1995, Lwasa 2004).

There are only two official dumping sites and none is professionally designed yet both are located in/close to wetlands with human settlement around, exposing residents to health hazards. Another major problem in waste management is the absence of the culture of sorting waste, by type at generation points in this case households, commercial centers and institutions. This results in mixing of biodegradable wastes with plastics and other environmental contaminant materials, which are all later, disposed of in the same land fill (NEMA 2000/2001). On the other hand, collection and transportation operations constitute the largest organizational challenges and financial burden in municipal solid waste management systems. There are several other unofficial dumping sites in and around the city. Most are located in wetlands, on which owners use dumping as a reclamation procedure.

Uncollected solid waste is not only a problem for Kampala but many other cities in the region (Mwaura, 1991, Peters, 1998 NEMA 2000/2001). These wastes have far outstripped the ability of the natural environment 'sinks' and municipal authorities to dispose them in a safe and efficient manner. Failure for proper management of waste has resulted in many people using unconventional methods of disposal which include pits within the backyards where it is regularly burnt, collect them in polythene bags and dumping them in streams, water drainage channels (Plates 6.3 and 6.4), along the road and unattended plots (plate 6.5, table 6.2). This leads to

blocking of water drainage channels and streams and subsequently causing flooding in the low lying areas during the rainy season unpleasant odors and loss of recreation potential as well as ecological services of regulation and provisioning. Flooding causes loss of property, time and even life(Lwasa 1999). These negative effects are depressing, unsightly and source of vermin infestation.

Associated to the problem of alternative duping sites by waste generators in the high collection fees levied by the private operators. According to Nabugabo Updeal Joint Venture, (2004), one of their challenge has been convincing residents to pay the waste collection and transportation fees as backed by the revised ordinances. In addition, high density settlements also pose a challenge of reaching to many households let lone tracking and following up payments. Due to these factors, breakdown of vehicles has become common and sooner than the later, the service runs a risk of inefficiency.

Table 6.2 Alternative methods of handling urban wastes.

·	Households	- Dump it, in the back yards, bury or burn it; dump it in open public place, water courses, drainage channels, road sides.
·	Medical facilities	- water courses, wetlands, roadside.
·	Industrialists	- water courses. wetlands, roadsides
·	Eating/drinking places	- backyards, streets, roadside, water courses, drainage channels.
·	Offices, shops	- open manholes, telephone cable manholes,drainage gutters, along streets and roads, backyards.
·	Markets	- along streets, and roads. manholes, roadside gutters, water courses etc.
·	Building/Renovation contractors	- unrepaired roads, concrete pavements, wetlands.
·	Saloons and hair dressers	- road/street side, open spaces.
·	Motor garages and petrol stations	- Open spaces, soil, water courses, along streets, manholes, and around homesteads.
·	Schools and Colleges	School premises.

Plate 6.3: **Solid waste disposal in drainage channels**

Plate 6.4: **A blocked drainage channel due to inappropriate solid waste management practices**

Plate 6.5: Construction solid waste dumped by the road side on an unattended plot

The public has not taken any positive steps in solid waste management practices like source reduction, re-using, recycling or properly disposing of the portion that cannot be reclaimed. Instead the public has for the most part maintained an **"I don't care"** attitude of generating as much garbage as possible unconscious of the implications for its collection and disposal. The earlier policies had depicted a scenario where the polluter transfers the burden of disposal to the municipality. Thus any additional effort to manage wastes would be transferred to the city authority leading to unscrupulous dumping, civic outcry for services and sometimes non-payment of municipal dues. This has for a longtime inculcated in public an attitude that the responsibility for solid waste management rests with the city authority. Disentangling this premise is one such target of privatization but it will take time before the 'polluter pays' principle is fully embraced by the public. This is a policy issue, which needs to be addressed urgently if waste management will change to reverse its current effects on the environment.

Continued lack of a deliberate policy to include environmental education both in the school curriculum and outside the formal education system; has made solid waste (garbage) to stand out as one of the greatest challenge in the city which requires urgent attention.

To improve its supervision role and improve on waste management, KCC has taken the following steps:

- Decentralization of solid waste management to divisional level.
- Privatization of solid waste collection and disposal through the tender process.
- Professionally build one of the two officially dumping sites as a sanitary landfill

Allowing private companies (e.g. BIN – IT, NOREMA, Nabugabo Updeal Joint Venture) to collect and dispose solid waste for a fee collected directly from the client. The private sector contribution is on the increase Table 6.3.

Table 6.3. Solid waste collection in Kampala City January to June 2000

Activity	January	February	March	April	May	June
Total waste (m3)	19,161	24,691	41,157	27,101	25,275	39,056
Collected (tones)	9,851	12,346	20,579	13,551	12,638	19,528
Private sector contribution (%)	10	29	60	45	33	59
Total waste collected, Transported and disposed (%)	41	57	89	60	54	87

Source: KCC (2000)

Inadequate solid waste collection by KCC and inappropriate methods used by other generators leave a lot of solid waste unattended to. This is a source of pollution and provides breeding ground for rats, fleas, mosquitoes etc. The consequences of poor waste management are very complex. However, the major impacts include:

Infrastructure destruction: Solid waste haphazardly dumped in manholes for drainage, telephone cables, sewerage system, roadside drainage gutters creates blockages and leads to floods across roads, streets, parks and other spaces.

The repair of underground telephone and electric cables is hampered as solid wastes block manholes that would facilitate easy access. This makes repair works expensive and many activities are disrupted because of constant service failures. The blockage of drainage channels by mud, polythene and other solid wastes create pools of water, which render transport during the rainy seasons messy and eventually potholes develop on the roads.

Contamination of water bodies: Most of the solid waste generated in Kampala is dumped in the wetlands and these are the major sources of domestic water to Kampala's population. Though 50% of Kampala's populations have running water on the premises (Kampala 1995) and more recent 2002 data indicates over 90% accessing safe water. Even then some pipes pass via solid waste and sewerage sites and water is bound to get contaminated since most of the pipes are very old. The concern for contamination is due to current accessibility to safe water with 36% of the population drawing their water from *"protected"* spring, 11% from unprotected springs and 3% from open courses with their waters from the wetlands and underground acquifers. These sources are contaminated through percolating leachates from decomposing garbage, discarded oils from garages and some pit latrines in the low lying areas directly touch the water table. Direct dumping is also evident on the shores of L. Victoria and its catchment region and yet 3% of the population draws their water directly from open sources (LAVLAC 2005). Generally Nakivubo swamp, which opens in L. Victoria, has a high nutrient load as a result of rainfall run off from Kampala City (Kansime and Nalubega 1998).

Sanitation and Health: Open dumping is the order of the day in Kampala City and this has created unsanitary conditions on streets and alleys. Such irresponsible dumping leads to unpleasant smells and are fertile grounds for breeding sites for flies and other vectors. The

scenery of flies, rodents and vectors scrambling for the rotting solid waste is unsightly and unhygienic. All this results in the pollution of both surface and ground water through leachate and impairing the permeability of soils as well as blockage of drainage system (NEMA 2000/2001 Plate 6.4) The public is threatened by communicable diseases such as diarrhoea, cholera, dysentery etc. Cases of cholera outbreak in Kampala are common, the most recent being early 2005. In a recent study of pollution load finding indicate high concentration of nitrates near unofficial dumping grounds in the catchment of Natete river, (Lwasa, Majjaliwa et al. 2006). This exacerbates environmental health problems in the urban poor settlements of Kampala metro area.

Increased Presence of Garbage and Polythene Bags: Most low-income settlements are littered with solid wastes and polythene bags (plate 6.6). The communities have been unable or unwilling to pay for garbage collection and sanitation facilities. Some people regard garbage collection as the responsibility of KCC using money from taxes. The study has established that there is lack of space to place garbage skips while landowners don't allow placement of garbage skips on their land. Coupled with lack of skips and inability of the private garbage collectors to cope with the generation rate, solid waste dumping sites are a common feature in Kampala especially in wetland and high-density residential areas. Most conspicuous of the waste stream is the plastic wastes in different categories from plastic bottles to polythene bags which are carried down stream in the catchments by storm water and wind. These have become a nuisance in the city and metro area.

Plate 6.6: Improper disposal of solid waste with negative implications to sanitation

Positively, some wastes in Kampala are converted into different resources such as metallic containers, which are collected by small-scale tin-smiths to make paraffin candles (tadoba), children toys, simple (local) measuring cans. Plastic and metallic wastes are collected for recycling both formally and informally. Milk packaging (plastic) materials are used for porting seedlings by tree and flower nurseries and women in Namuwongo and Kalerwe (both low class residential suburbs) have societies that turn garbage into compost; wrapping paper and envelopes respectively. Banana peelings and other plant leftovers are used as supplementary feeds to the expanding urban and peri-urban dairy zero grazing system. Piggery in and around Kampala

benefits from food leftovers from the formal and informal restaurants. The bones are collected, burnt, crushed and sold to industries like Ugachick, which make animal feeds. More recently plastic wastes have been turned into marketable products such as baskets, ornamental products and mats (Rugadya 2006).

6.2 Land use/cover changes

Increase in urban population, industrialization and the associated demand for housing have led to land use/land-cover changes. From the classification of the Landsat Images of 1980 and 2002, the analysis shows that in 1980, the land use land cover was predominated by agriculture activities occupying 62.2% of the total land area compared to 16% built up are and 1.7% for industrial activity. The 2002 classification of the analysis area indicates significant changes for built up and industrial use. For both built up and industrial uses/cover, the area occupied more than doubled in the period of 12 years while agriculture declined by a quarter mainly because it is convertible (Table 6.5 Map 6.1 and 6.2).

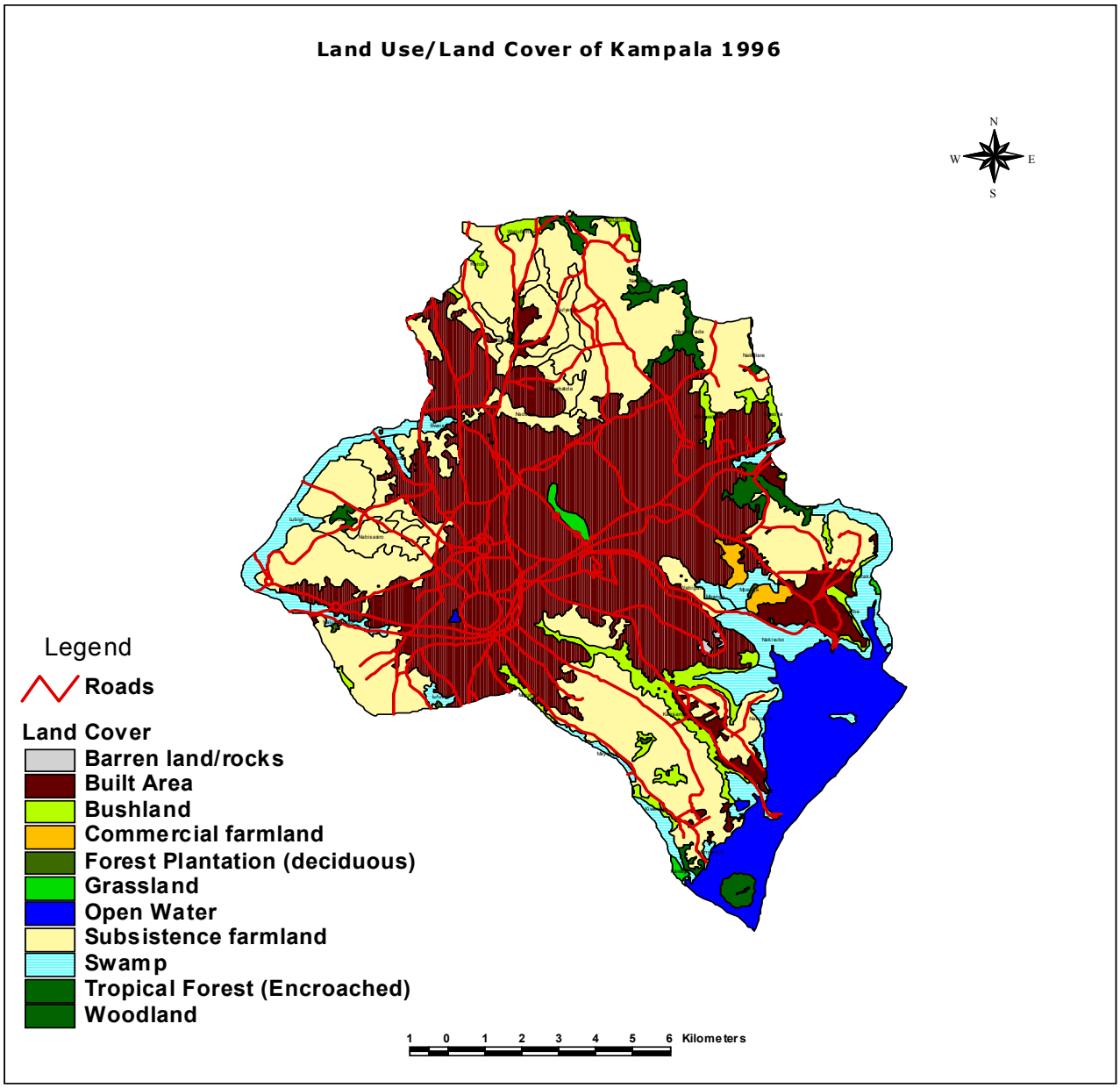
Table 6.4 Land use/land-cover in Kampala

Land Use/Land Cover	Area Ha 1980	Percentage of Total 1980	Area Ha 2002	Percentage of Total 2002
BG: BareGround	0.0	0.0	362.2	0.9
BO: Built Up Other	6192.0	16.0	12269.6	31.7
F: Forest	458.6	1.2	1032.3	2.7
G: Grassland	1092.2	2.8	2155.4	5.6
ID: Industrial	669.4	1.7	1827.0	4.7
OP: Open Water	2193.6	5.7	2147.6	5.6
S: Swamp	1092.1	2.8	1112.6	2.9
SA: Subsistence Agriculture	24045.4	62.2	17622.6	45.6
SW: Swamp Forest	2921.5	7.6	135.4	0.4
Total Area	38664.7		38664.7	

***Source**: Land use/cover maps derived from Landsat images 1980 – 2002*

A further analysis of the land use/cover indicates that industrial land use changed by 172.9%, built up changed by 98.2% and forests by 125%. The increase in forest cover mainly in the northeastern part of Kampala which was still rural taking advantage of the demand for eucalyptus poles used for building in the city. For the other land use/cover classes of agriculture and swamp forest, the change was negative implying loss of swamp forests and agricultural land. Similarly swamps which are mainly covered by papyrus also reduced over the period of 12 years from 20.6% to 1.9% occupancy of the land area. Industrial land use, forestland use and built up land changed faster at 8.9% forest 11.4% and industrial at 15.7% p.a respectively. The rate of change in industrial and built up is the main concern in terms of the relationship between industrialization and housing. The change rates of industrial and built up showed a relationship between the two classes of land use. This is because industrial establishment imply increased demand for labor and housing for the laborers. It is also evident that industrial areas such as the main industrial complex that stretches from the civic area to the Nakivubo swamp is surrounded by high density residential areas including Kisugu, Namuwongo, Kibuli all of which provide residence to the laborers for the industrial area and other industrial places in Kampala. A spatial analysis of the two classified land use/cover maps through cross tabulation reveals that wetland areas have been degraded mainly by built up and industrial development.

Map 6.1: Land Use /Land Cover 1996



Source: Generated from data collected by National BioMass Center 1996

6.3 Wetland Degradation

Kampala's wetland inventory was first carried out in 1993 as a pilot district for the wetland inventory process. Due to the location of the district in an area of high population density, commercial and industrial development, the size and biodiversity of unconverted portions of the wetlands has drastically diminished, with some areas completely converted (Map 6.2). The determination of wetland use in Kampala has been complicated by over-lapping of authorities on the determination of land use following the enactment of the National Environmental Statute in 1995. Most land use zoning and permitted development in Kampala is done under the Town and Country Planning Act, and supercedes the Environmental Statute, which empowers the National Environmental Management Authority also to determine land use. The Environment law, clause

47 in particular, restricts development on wetlands. Besides the Land Act of 1998, under clause 46, states that the *use of land conform to the provisions of the law relating to the Town and Country Act and any other law.*

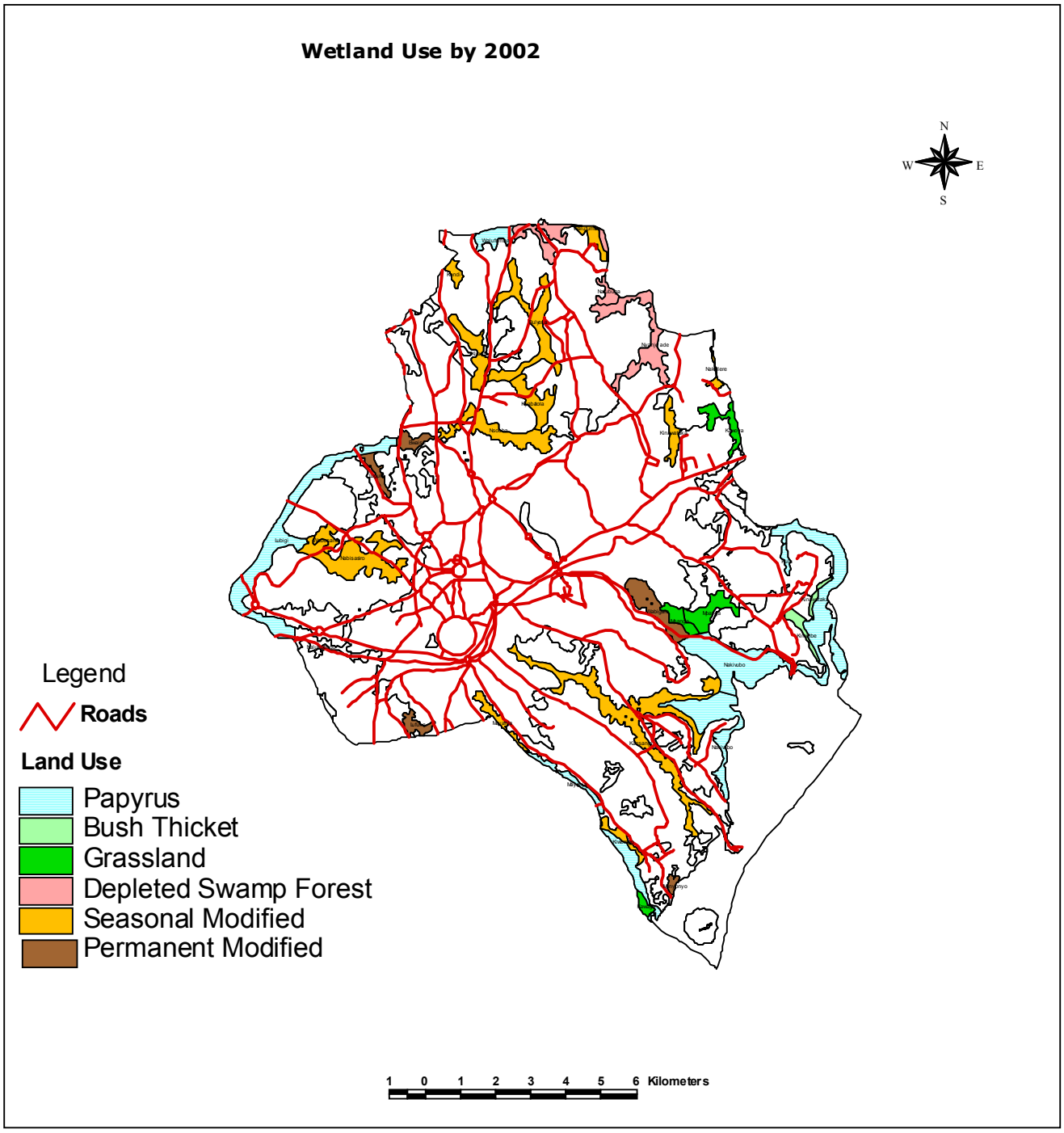
Wetlands in Kampala district continue to face serious threat of total destruction, as they are the last 'free' or cheap areas for infrastructure development despite their designation as 'green corridors'. In 1993 it was noted that 13% of the wetland area was severely degraded. However, the estimate in 1999 showed that 46% of the wetland was severely degraded and by 2002 only 3.3% was remaining and was continuing to be degraded (MWLE 2002). A recent example is the construction of the Northern Bypass, which had three possible routes; the green route (which passes in the wetlands) was selected and implemented. Currently, construction activities have cleared the wetland area, blocked drainage and caused increased flooding in many parts along the northern bypass. The high population density (approx. 3, 974 persons per $km^{2)}$ is one of the main causes of wetland resource degradation in the district. It is estimated that about three quarters of the wetland area has been significantly affected by human activity.

Wetlands are also under extreme pressure due to uncontrolled and unplanned development activities (Plates 6.7 and 6.8). The most detrimental activity is industrial development, which has destroyed the Kinawataka wetland, between Nakawa, Ntinda and Kireka, and part of Nalukolongo. Second is residential development, which is affecting several wetlands, notably Nsooba, Bulyera, Kiyanja, Kansanga, Kyetinda, Mayanja and Nakivubo (Map 6.2). In the FGD conducted in Bwaise, residents noted the increase in housing development in wetlands due to population increase and demand for housing. But being traversed by the northern bypass it was also observed that increased flooding is largely due to the blockade by construction works.

Plate 6.7: Unplanned developments in a wetland

Plate 6.8: Encroachment and dumping of solid wastes in a wetland

Map 6.2: Wetlands in Kampala by 2002



Source: MWLE, Kampala District Wetland Inventory Nov 2002

Analysis of settlement patterns in Kampala and its environs shows that several residential, commercial and industrial buildings are located in former wetlands which have been successfully drained to give way to housing construction and other socio-economic activities (Plate 6.9). These developments can be observed in Nakawa-Kyambogo and Nalukolongo industrial areas, the residential areas of Ndeeba, Bwaise III, Nateete and Katanga in Wandegeya among others.

Plate 6.9: Unplanned residential housing in a wetland

In Kampala, settlement development has overtaken planning. The failure to enforce strict urban planning regulations has made the city a freelance specter for all sorts of illegal developments leading to overt irregularisation and informalisation. The wetlands have been more prone to unplanned informal and unregulated settlements. The main reasons for encroachment on wetlands include lack of income and lack of enforcement of development control. Most households have invaded the urban marginal areas and wetlands in particular for farming as a precursor for subsequent settlement. People have invaded wetlands to carry out cultivation after which they use the same land to construct illegal dwelling units.

The encroachment on the City's wetlands happens for various reasons:

- Wetlands are the last 'free' areas in Kampala, for which ownership is either not very clear or not seriously pursued. The poor people move into such areas, where they can put up structures more or less free of charge.

- Lack of co-ordination and planning in the allocation and development of plots. Various actors, like KCC, UIA, UMA and individuals allocate or develop plots in wetlands in disregard of any infrastructure plan, including works for drainage. In cases where wetlands get totally blocked, storm water will spill over onto roads and other corridors, causing road foundations to collapse, and culverts and under ground sewage systems to get blocked.

- Lack of enforcement mechanisms. According to KCC officials the various laws and regulations in place to plan the City and manage the wetlands may be contradictory, vague and lack the necessary statutory instruments for implementation. As a consequence, it is often impossible to charge developers without running the risk of loosing the case and paying damage to the developer. Many officials therefore, do not pursue such cases.

- Wetland lease procedures that are concluded now were started long before the coming in force of the National Environment Statute and other legislation. Although no new leases in wetlands are supposed to be given out, the issuing of leases continues for those that were already in pipeline. Therefore, many of the developments that are critised today are the result of bureaucratic procedures started years ago. Such developments, although dangerous, cannot easily be stopped.

- Political interference is involved in many cases of wetland abuse in Kampala. The abusers are well connected politically. In several instances where KCC did not stop a development, such connections helped to overrule the decision.

- The enforcement capacity amongst the various institutions charged with environmental management and City planning is very limited. The Wetland Inspection Division has four staff, too thin for an effective monitoring of wetland abuses or legal action against abusers. Similarly, NEMA's monitoring department is small and also has a countrywide mandate. The only organization, which has in principle the human resources to monitor wetland abuse in Kampala, is KCC. Due to political interference, deliberate breaching of the law and ulterior motives, the enforcement is not effective.

- Lack of knowledge and understanding amongst wetland users, law enforcement officers, and legislators about the functions of the wetlands, the laws and regulations in place, and the mechanisms for law enforcement.

6.4 Environmental Consequences of Wetland Degradation

There are a number of significant consequences resulting from encroachment on wetlands. Flooding has increased tremendously due to wetland destruction as witnessed on most rainy days (Plate 5.1, 5.2, 5.3 and 5.4). Most developments in the formerly wetland valleys suffer several hours of flooding and the tendency is to call on planning authorities for help yet the same authorities are never consulted before the unplanned developments are implemented. The factors causing flooding include wetland flood storage being reduced by in-filling but also increased impermeable surfaces in Kampala causing faster run off with less infiltration and less storage space. Concretizing courtyards and back yards, often in the upper slopes of the hills where medium to high-income people reside, creates impermeable surfaces. The impermeable surfaces increase run-off and associated to this problem is the non-existent of wide spread harvesting of rainwater by residents Kampala metro area. With continuous clearance and concretizing in the upper slopes, storm runoff and waste water always finds its destination to valley bottoms through wandering, uncoordinated drainage channels and gullies causing socio-economic problems and environmental burdens both up and down stream.

Most of the seasonal wetlands have been modified through drainage for crop production, especially for yams, sugarcane, maize, beans, sweet potatoes, cassava, and vegetables. Some permanent wetlands – e.g. Nakivubo- have also been modified for agriculture. The main crops grown are water-tolerant including yams and sugar cane. Generally agriculture is not a serious threat to the integrity of wetlands as long as no drainage is done and conversion remains on the seasonally flooded edges.

Other destructive human activities common in the wetlands include brick-making (e.g. Kayunga, Bulyera, Kyabatola and Nsooba), sand extraction (e.g. part of Kinawataka), papyrus over harvesting (e.g. Lubigi and Nakivubo), burning of swamps and hunting. Other most affected

wetlands are Nakivubo Kinawataka, Nsooba Kyetinda, Kasanga and Lubigi all of which represent the major natural drainage systems of the Kampala metro area.

As a consequence of urban population growth, development and expansion, the wetlands in most parts of the city have been drained and turned into agricultural areas or developed for commercial, industrial and residential purposes. In many areas, what remains of these places are the drainage channels which help with the flow of water out of these wetlands.

The wetland systems which offer environmental services to the peri-urban communities have been exposed to threats from land use changes and pollution loads (Plate 6.10). By communities settling in wetlands, their vulnerability to floods has increased and threats to their livelihood, exposure to pollution as a feed back interaction exacerbated. With such an interaction of driving forces and outcomes, there is need for reduction of vulnerability through adaptive measures by the communities. To this end it is important to reconsider the protection of wetlands as an alternative to utilization in the face of urbanization and agglomeration (Schuijt 2002).

According to (Matagi 2001) most of Kampala District consists of residential, agricultural and economical activities, with natural habitat and animal life limited to the less disturbed areas, which are planned zones from the earlier schemes. But developments have adversely changed the environment especially the most significant environmentally sensitive component of the wetlands in Kampala, which form a natural boundary of Kampala especially to the west and east. Due to industrialization and urban activities, the wetlands of Kampala have been greatly encroached on, cleared and polluted. Evidence of increasing pollution load for different water resources mainly by heavy metals, microbial organisms (Matagi 2001; Handasah, IDC et al. 2002 and (Nabulo 2002)) exist. The most polluted drainage channels in Kampala District in order of severity are Nakivubo, Bwaise and Kinawataka (Handasah et al 2002). Nakivubo and Bwaise channels have high loads of silt and are also high in organic matter and nutrients possibly from illegal sewerage connections but also from clearance and development of hilltops. Kinawataka is polluted by industrial effluents from Nakawa industrial estate and occasionally has an oily surface scum generated from the numerous automobile garages in its catchment. The other channels (Nalukolongo, Kitante and Lugogo) are less polluted and flow comprises mostly of stream water and surface run-off (Matagi 2001).

Farmers encroach on Kawoya wetland area

By John Kasozi

JOHN KASOZI

BANDA market traders and farmers have encroached on Kawoya wetland. Kawoya wetland has a total area of 0.53 square kilometres.

Located partly in Nakawa division and Kira sub-county, the nearby villages include Banda, Kireka and Kamuli. This permanent wetland occupies a shallow and relatively narrow valley below Banda and Kamuli hills draining into Kinawataka swamp. It has patches of papyrus and relics of swamp forest upstream. It is part of Lake Victoria catchment area.

Late last month, environmental inspectors carried out an inspection of the wetland to assess the compliance of land use with environmental laws and regulations.

The findings indicated that the wetlands had been degraded over time.

"We have issued the traders with an Environmental Improvement Notice (EIN)," Wilfred Bbanabakintu, the National Environment Management Authority (NEMA) public relations officer said. The document revealed construction wetlands, dumping of solid wastes, erection of structures, slashing and trampling on the ground for creating a market.

The activities being carried out on the site are illegal and had no approval by NEMA contrary to the National Environment Act Cap 153. According to Wetlands and the Law, August 2000, "No one in Uganda can lay claim to ownership of any wetland or part of wetland if that claim was made after the coming into force of the constitution 1995." It is in Uganda's national policy for sustainable development to protect wetlands for ecological purposes.

Even in *mailo* land, wetlands remain as land held in trust by government for Ugandans according to 1900 Uganda Agreement.

No government department can lease out any specified natural resource; and that includes wetlands according to the Land Act of 1998.

The ecological functions of wetlands include maintenance of water table, prevention of erosion and reduction in extreme flow and sediment traps.

Wetlands receive a lot of run-off water from surrounding hills and helps to regulate the rate of flow reducing soil erosion.

The improvement notice served to the traders and farmers instructed them to vacate the wetland. This was to allow natural wetland regeneration and restore it to its original green state including refilling the drainage channel, level the area and allow free movement of the water and flooding the wetland.

The statement read, "All construction and wetland clearing operations and selling of products in the wetland must have ceased by midnight last month.

They were given two days from the date when they were issued with the notice to comply with the environmental orders.

Joseph Nsubuga, the traders' secretary, said they should be given enough grace period to leave. "The short notice puts many of the farmers in the tight corner. The money used by some farmers is borrowed from micro-finance institutions and yet it has to be paid soon."

EXPLOITED: Part of Kawoya wetland under occupation by farmers and traders in Banda

Plate 6.10: A wetland on the fringes (Banda-Kireka) of Kampala that has been converted into a market

Box 1: Bwaise Wetland

In the 1980s, Bwaise was a wetland, which was gradually cleared from 1986 as the population increased. This has resulted in flooding. The major problem is that, the drainage tributaries are lower than the main drainage channel. Instead of tributaries draining the water flow into the main drainage, it is the main drainage that drains the water flow into the tributaries causing flooding. Businesses come to a standstill, and property is destroyed (Plate 4.4**)** The main drainage channel which used to drain the water is filled with garbage.

The local people dump refuse in the drainage blocking its flow. This creates a back-flow and flooding during and sometimes up to 2 hours after the rains.

High disease incidence particularly, malaria, diarrhea, stomachaches and because of the stagnant water mainly from drainage channel and uncut bushes. The number one killer disease in Bwaise II is malaria accounting for 60% of disease-related deaths, followed by acute respiratory infections (20%), diarrhea (20%), worm infections (5%) and others (5%) (Kirumira, Divisional Health Inspector, Kawempe).

One of the problems that caused the cholera outbreak was the construction of pit latrines very near the drainage channels. When the pit latrines fill, the owners empty them up into the channel. The study established that because of the high water table in the area, "It is more expensive to build a pit latrine in the area"

Source: Kampala District Wetlands, Ministry of Lands, Water and the Environment (November 2000)

Box 2: Ntinda wetland

Ntinda is located in Nakawa Division of Kampala District. This is a growing residential area found on top and slopes of the hills as well as in the wetlands with in the division. Like all towns in Uganda, urban development, particularly residential housing is increasingly taking place unregulated. Attempts by Kampala City Council to guide and regulate developments in the city centre and urban fringe have not only failed but have reached far-reaching conflicts between different government institutions. The same view has been expressed by Nakya (1996) that unregulated planning dominated Moshi municipalities and landed the municipality in court of law because of the conflict that arose between housing developers and the municipality. The factors that cause these conflicts between institutions and other stakeholders (the people) include lack of coordination between the institutions and lack of collaborative planning approach among all stakeholders. (Nankya 1996).

Ntinda area is administratively a part of Kampala City Council and therefore its developments are guided by KCC structure plan of 1994. This plan shows major land uses distribution and infrastructure networks. The structure plan shows spatial choices concerning the location of major land use areas. it serves as the base document for the programming of public works and the main utility works. The above description therefore implies that any developments taking place must be guided by the regulations stipulated in the structure plan.

Ntinda has gained status exclusively as a high income upper class and has a high occupancy rate per plot of available land. The increase in occupancy rate however is taking considerable toll on the area including the wetland areas which according to NEMA Statue (1996), these are areas that should be protected and conserved. What follows below is an illustration of people's plans to Ntinda wetland area and the conflicts that arose between different stakeholders.

On 27th April, 2003, a heavy down pour lasting six hours left all flood-prone areas in and around Kampala drenched. More than seven houses in Ntinda area were filled with water to the top of window level from the wetland that drains Ntinda and the Kyambogo area. The houses which were submerged were approved by KCC to be constructed in those areas however, KCC was not ready to compensate the owners because the property was constructed illegally in the area.

Following this unfortunate event, the following day the directive from the Ministry of Water, Lands and Environment, that all homes in wetlands should be razed. The state minister began by saying.

> "KCC had refused enforcing laws and regulations put in place to stop construction in the wetlands. He said that one of the regulations that KCC has Been pressured to put in place the Ministry and Environmental organisations, is to engage. A private agency unlikely to be corrupted to Evict encroachers and demolish all the structures In wetlands."

The minister continued:

> " *We talked to the mayor to look for private enforcement agents who cannot be bribed to evict people and demolish the buildings at a cost, but the council rejected the idea."*

Following this directive, the mayor responded by saying that KCC should not take the blame and that KCC was not going to compensate people who lost property because their buildings were illegal and had no occupational permits. The mayor continued by saying.

> *"These people built in the water way. There are so many illegal buildings in swamps and those are the ones affected by floods"*

The above illustration shows people's actions in the light of several development planning issues: namely collaboration of communities with urban authorities to be educated about sectoral policies in respect of residential settlements, and the consequence of this is that people have come up with their own plans resulting in haphazard housing development in protected areas. Secondly, the example also illustrates people's actions caused by conflicts that arise between institutions because of lack of coordination on policy matters. This situation was greatly facilitated by some of KCC officials who cleared the building plans in Ntinda area without consideration of the NEMA 1996 statute which govern wetland use.

The drainage work and redevelopment of Nakivubo channel is another example that illustrates the mismatch in the city development. One official from the Ministry of Water, Lands and Environment was of the view that something had gone seriously wrong with Nakivubo channel redevelopment and that Lake Victoria was being threatened. The following is an extract from the officer's explanation.

> "KCC should stop the channel which drains the city from pouring its water directly into the lake and instead should be diverted to empty its effluent laden water into Wabigalo wetland for a period of residence to shed the dirt before entering the lake".

Following this Officer's statement, the then Town Clerk responded by saying:

> *"That Nakivubo channel was not built to solve flooding in the whole city but only in the central business district, and that the flooding being seen was in peripheral areas and not in the city centre."*

As mentioned earlier, this is an illustration of planning problems caused by lack of coordination among relevant institutions and planning agencies.

Source: Kampala District Wetlands, Ministry of Lands, Water and the Environment (November 2000)

6.5 Water pollution

Water is by no doubt essential for life and health. Therefore the quality and quantity consumed are significant factors for the well-being of the urban population. According to estimates from the NWSC, 55% of Kampala's population has access to piped water, while only 8% has running water in their houses.

In Kampala, consumers provided with piped water can either have in-house connections or they can draw water from public Stand Pipes (SPs) or yard taps. Yard taps are basically the same as SPs but they are situated on the properties of homeowner or serve less people, as they are not for public or commercial use. Stand pipes are just connections to the piped water systems, where people buy water form kiosks. There are no existing laws or applied standards governing their construction and the number or households per SP. Presently Local Councils or private persons administer the operation, repair and maintenance of SPs. In many low-income areas, SPs are installed by NGOs (KCC and World Bank 2000). Some areas in Kampala have not been supplied with piped water because the housing structures in those areas are illegal and the people residing there are encouraged to move, or rather discouraged to stay. (*Interview with Mr. Kyamanywa, Senior Town Planner and Acting Chief Town Planner*).

Kampala has its raw water intake in Murchison Bay, where there is increasing pollution from the city. NWSC therefore uses an increasing amount of money on water treatment. Water leaving the plant at Gaba is of international standard (Nostrand 1994), but it may become contaminated on the way. Due to poor maintenance leakages of the sewer and water systems (NEMA 1997A, (NWSC 2006). It is relatively easy for sewage and household wastewater to enter the water distribution mains. The report also attributed some of the bursts and leakages to the increased pressure after the commissioning of Gaba 2 (Nostrand 1994). Mains bursts are not always reported to NWSC immediately (Wasswa 2002). Leakages may be too small for the NWSC to register a drop in pressure, and it may therefore be long before they are repaired. Meanwhile contamination can enter the pipe.

The greatest change in quality is mainly experienced during the morning hours. Many people complain that standpipes bring contaminated water in the morning, where water comes with brownish colour or stain. According to NWSC official, this was attributed to corrosion in the pipes due to chlorination. Quality can also deteriorate after cleaning operations and repairs, when contamination may enter the system. Visible contamination does not however appear to be a frequent problem, although the frequent occurrences influence people's perceptions significantly. In the FGD conducted in Mulago III parish, residents expressed doubt about safety of the piped water and although the recognized it as the primary source of water, alternative sources of protected springs are commonly used.

Protected Springs

The protected springs are other frequently used water-sources. The protected spring is constructed using stones and gravel of different size to filter the water, which runs underground in the hillside slopes. The water accumulates at a collection point, where it is fed from one or more outlet-pipes. The water runs non-stop regardless of whether people fetch it or not, as there is no stop-tap. Protected springs supply more water during the rainy season and less during the dry season. Belonging to a natural system, they collect and purify water effectively if well maintained. At protected springs water is free of charge. This is one of the reasons why many people use them. Even though it is a free good, some people make a profit from this water as well. Vendors transport water at a fee to households that desire and can afford their service. Regular deliveries may be agreed, for example every second or third day. Where no such agreement exists, the customer can call the vendor in the street and the water is delivered to the

doorstep (FGD 2005). Given the right circumstances, protected springs have the potential of delivering water of very good quality. Sadly this often is not the case in Kampala, where e-coli pollution is often found in samples (Nostrand 1994; NEMA 1997a; Howard & Luyima 1999; Tumwine 2002). According to NWSC seepage to ground water due to poor waste disposal is most serious threat to protected springs, the water quality deteriorating noticeably during the rainy seasons (Howard & Luyima 1999). In many areas of Kampala the protected springs have garbage-dumping sites in the vicinity.

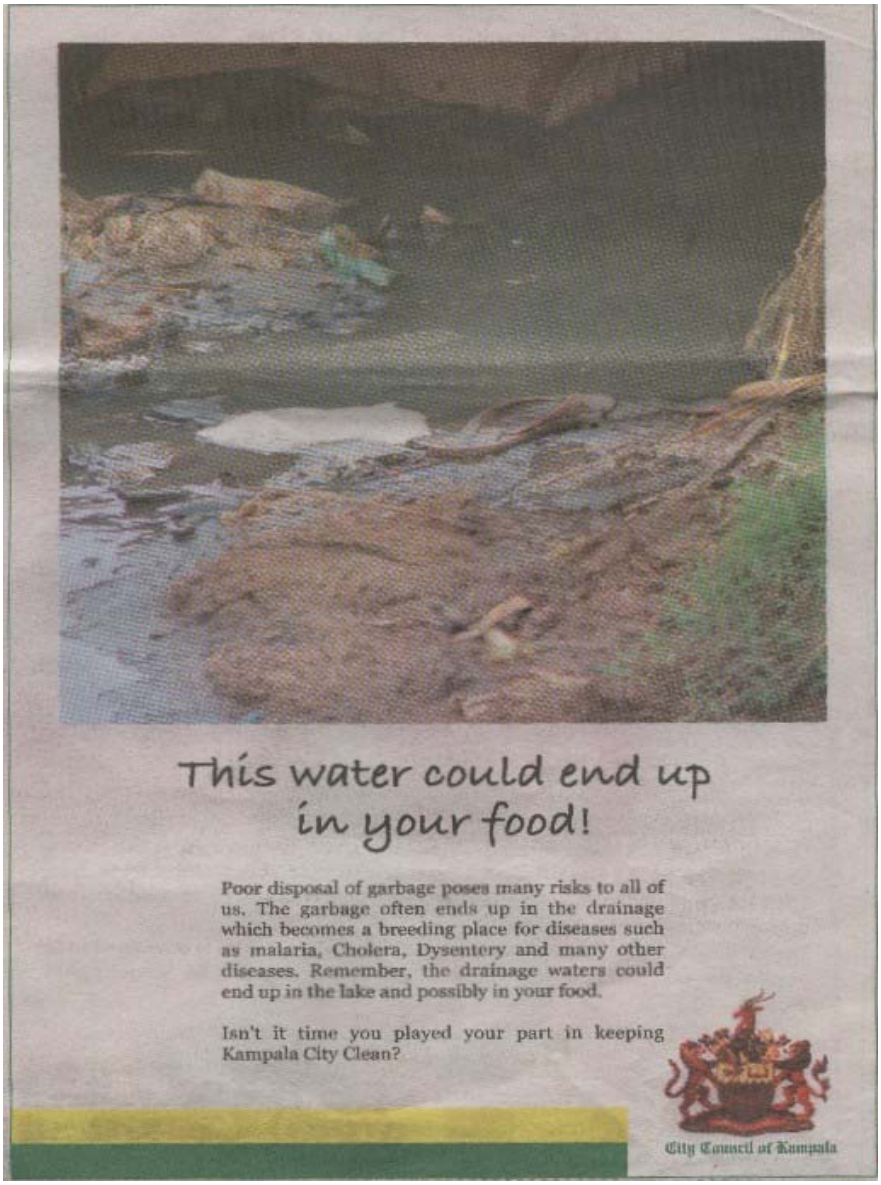
Poor maintenance of protected spring may contribute to poor water quality. A blocked drainage channel can lead to stagnant water, leading to contamination of the spring and favourable breeding conditions for mosquitoes capable of transmitting diseases like malaria. The area around the spring may also become a source of cholera (NEMA 1997a). Children playing at and around the springs represent an added risk. They often drink directly from the pipes, step directly on them, or put things into them, causing contamination and blockages. According to (KCC 1998), the problems of protected springs stem both from poor maintenance and poor design.

Unprotected springs

Unprotected springs are the third water source commonly used in Kampala. They can be compared to protected springs, but the water is usually of much poorer quality. Being unprotected they lack the construction characteristics of protected springs. They are merely holes in the ground, dug down to the water table. An unprotected spring is sensitive to environmental changes. In the rainy seasons it carries a lot of water, while in the dry season it can more or less dry up. Depletion can also result from continuous use, e.g. during a certain period of the day. Maintenance is usually carried out by the community who clear the drainage channel remove algae that accumulate easily in the open pool and on the walls of the spring and cut the surrounding vegetation. Work rotates according to a schedule, and this seems to function quite well. In Mulago III parish, this rotation is enforced by a community-based system of organization which has a committee on public health composed of leaders and residents of the area (FGD 2005).

Like unprotected springs, the protected sources of water are often located at breaks of slope between hillsides and flat land they are exposed to contamination, particularly after heavy rainfall. Pit latrines are usually scattered in the immediate vicinity of unprotected springs. At some springs an accumulation of garbage make very unpleasant conditions. The drainage channels from unprotected springs, which are not cemented, tend to become easily blocked. Slow drainage leads to stagnant water, good breeding conditions for mosquitoes, and risk of cholera (Plate 6.11).

Plate 6.11:



City Council warning on irresponsible solid waste management

Note: Solid waste carried by rainwater ends in unprotected water sources used by sections of the urban population.

Rainwater

Collected rainwater is the fourth source of water. During the rainy seasons, water-fetching practices change considerably. In Kampala there are two such seasons, one between March and May and the other between September and November. The wealthier have specially designed water tank, while others collect it in drums. Collection of rainwater does not necessarily lead to a large increase in consumption, since the use of water from other sources seems to decrease at such times. In more wealthy housing areas rainwater is often used as a backup source, in case of failure of the piped water supply. Also larger institutions often have rainwater cisterns as a back-up supply

Of particular importance to water pollution are those so-called 'wet' industries that discharge their wastewater into public sewers or storm water drainage channels, which eventually enter surface water (Droruga, 1990; Matagi, 1993). Nakivubo Channel, a storm water drainage channel

that passes through the Central Industrial area, has the highest concentration of the 'wet' industries. These industries include 4 soft drink factories, 5 textile industries, 2 abattoirs, 2 soap factories, 4 paint industries, over 24 engineering workshops and garages, and 1 leather-tanning factory. Most of these industries have obsolete technologies, which in most cases are environmentally polluting. For instance no factory has pre-treatment facilities for their wastewater before it is discharged into either the environment or public sewer. Industries in this zone have a combined estimated daily discharge of 5000 m3 of wastewater (Droruga, 1990). Unfortunately most of the industrial effluents end up in Murchison Bay of Lake Victoria, which at the same time is the source of water supply for the city. In essence the city is drawing water from its own waste dump (Kizito, 1986; MNR, 1992; Matagi, 1993). Therefore, the future security and integrity of water quality for the city's water supply source is questionable, if industrial wastewater treatment is not properly addressed (Table 6.2). In a most recently concluded evaluation by NWSC, costs for treatment of water have increased partly due to the fall in Lake Victoria levels but also due to increased pollution load.

From the field reconnaissance survey, and Focus Group Discussions (FGD) it was observed that significant contamination occurs in the streams flowing through the wetlands of Kampala. During field trips, it was observed that sewage was often discharged directly into the channels. Although no bacterial data is available, it can be assumed that bacterias contamination from human and domestic waste is high due to the outfall of the sewage treatment plant into the driange system as well as the wide spread non-point contamination from pit latrines. This poses a health risk to those living in the vicinity of the streams, if they should come into contact with the water.

Table 6.5 Pollution levels in different water channels in Kampala

Station	Kitante Station 5	Lugogo Station 7	Bwaise Station 3	Natete Stat. 2	Kyambogo Station 8	Kinawataka Station 9	Nakivubo Channel	Naluko-longo	Lugogo Stream	Kitante Golflane	Batvalley
Conductivity											
MAX			413	349	232	348	546	390	284	358	597
75TH PERC			355	320	224	295	499	379	184	253	459
MED	174	162	308	297	207	267	438	300	175	239	379
25TH PERC			289	267	185	244	430	241	160	184	268
MIN	Station 5	Station 7	275 Station 3	215 Stat. 2	172 Station 8	194 Station 9	360 Channel	193	148 Stream	169 Golflane	207
PH											
MAX			8.3	7.6	7.2	6.9	7.2	7.7	7.4	7.3	7.1
75TH PERC			7.3	7.3	7.1	6.9	6.9	7.5	7.0	7.1	7.1
MED	7.48	7.04	7.2	7.2	6.9	6.7	6.9	7.5	6.8	7.0	7.0
25TH PERC			7.1	7.1	6.9	6.7	6.9	7.4	6.8	6.8	6.8
MIN			6.9	7.0	6.6	6.3	6.6	7.3	6.6	6.2	6.7
MAX			1.16	0.41	0.52	0.45	1.97	1.07	0.47	0.84	3.17
PO_4											
75TH PERC			0.74	0.38	0.26	0.32	1.54	0.60	0.21	0.45	1.93
MED	0.11	<0.08	0.33	0.34	0.17	0.28	0.99	0.22	0.14	0.37	1.14
25TH PERC			0.19	0.29	0.12	0.21	0.86	0.22	0.13	0.29	0.78
MIN			0.12	0.23	0.10	0.12	0.54	0.11	0.11	0.26	0.25

Source: *(Handasah, IDC et al. 2002)*

From table 6.5, the pollutants analysed include Electricity Conductivity, pH and Phosphates. From the results, it seems that the natural background conductivity of the water is in the order of 200 μS/cm, which is equivalent to about 140 mg/l of dissolved salts. This is in line with what could be expected for Kampala, taking into account the geology and soils that is dominated by highly leached lateritic soils.

Due to human activities salts are added to water used for industrial and or domestic purposes. Salinity is, therefore, a good indicator of wastewater pollution. In this instance, the Nakivubo Channel stands out from the rest, with a median conductivity of 438 μS/m. This is probably due to the discharge of treated wastewater from the wastewater treatment works, as well as discharges from the industrial establishment in and around the Nakivubo swamp. Areas that show significant increases in conductivity include Bwaise (median of 308), Natete (median of 297), Nalukolongo (median of 300), and Batvalley (median of 379)(Handasah, IDC et al. 2002). These areas are dotted around the major drainage basins of Kampala, which implies an almost even distribution of pollution in the city and metro area. A natural background pH value for streams in Kampala seems to be 7, which imply neutral water, neither acidic nor alkaline. The pH is a good indicator of contamination by industrial discharges. A small numeric change therefore signifies a large change in water quality. According to the Handasah et al. (2002), the only site, which showed a significant deviation from pH of 7, was Nalukolongo where the pH was analyzed as 7.5. This does show that there is a source of pollution upstream, which includes industries in Ndeeba as well as other activities. Phosphate (PO_4) is an essential nutrient for plant growth, including aquatic plants and algae. It is normally the limiting nutrient that determines algae growth in a water body. It is, therefore, the variable of concern with respect to changes in water quality of the sections of wetlands with relatively stable water flow. Phosphate in wastewater originates from the use of soap and detergents, as well as sewage. Normally PO_4 concentrations in uncontaminated water are fairly low, typically less than 0.01 mg/lP. The KDMP data on PO_4 indicates that this was exceeded by a wide margin for all the samples, which shows either widespread contamination of all the streams by domestic waste. The relatively high phosphate concentrations are a cause for concern, and underline the importance of maintaining the papyrus swamps, which remove at least part of the phosphate as the water flows through. But with the threat of industrial development and encroachment on wetlands by housing development, PO_4 is likely to increase will contaminate the water source of the city, which is Lake Victoria. This reveals even more concerns given the uncoordinated disposal of wastewater from residences and commercial centers. Disposal of wastewater to any available space implies widespread non-point pollution from PO_4 and other pollutants. The lack of a proper sewer crowns the problem of non-point pollution.

However, Droruga (1990); Matagi (2001); Handasah, IDC et al. (2002) note that the water, although contaminated, is still of good quality and can be used for almost all uses. The high phosphate and ammonia concentrations as well the increasing heavy metals in the wetlands are a concern. The entire Kampala District sewer system, the disposal of domestic (household) waste and disposal of industrial wastewater into the storm water system needs to be investigated in depth. This would form a basis for environmental policy for sustainable development of the city and metro area.

6.6 Sanitation

The rapid annual population growth of Kampala dominated by jobless youths who cannot afford decent housing has resulted in the development of slums which are characterized by poor sanitation, poorly constructed pit latrines and frequently total lack of water supply.

Water supply and sewage disposal, which are important in influencing sanitary conditions of an area are inappropriately distributed and poorly managed in Kampala. Piped water has been in existence since 1929 and is today managed by NWSC with the intake/treatment point at Ggaba (Lake Victoria) about 11 km from the city center. Though water is treated to international standards, it is contaminated due to poor maintenance of the distribution system, sewer, storm

water networks and leaks (10% of the daily water output is lost to leaks). There is also contamination from suspended solid particulate matter as storage tanks are left open for long. Only 8% of the population has piped water in their houses while another 42% can access it from standpipes outside their homes. However most of the pipes do not have water throughout the day with some as non-functional. The other sources of water are protected and unprotected springs which serve 36% and 1% of the population respectively.

In addition, 1.4% of the population accesses water from streams, rivers, lakes, ponds and another 0.5% from boreholes. The non-piped water supplies which are located in the high-density areas are prone to contamination from human activities which include poor disposal of domestic wastes, sewage and construction of pit latrines on upper slopes. Water samples from most of the springs revealed pressure of *Escheleischa Coli* an indication of faecal contamination (Byabakama 1998).

The distribution of sewage and toilet facilities in Kampala is uneven and varies in quality and cleanliness. The majority of the households 83% use pit latrines and only 6% have water borne toilets in their houses, 2% have no toilets, 14% have no bath rooms, 60% and 12% share outside and inside bathrooms respectively and 11% use unshared outside bathrooms (UBOS 2002). Due to the unavailability of toilet facilities some households have improvised "mobile" toilets in form of plastic bags which are disposed off at night either in the open or flowing water.

Poor sanitation is compounded by most of Kampala not being connected to the public sewage system. When it rains, the poorly constructed pit latrine and carelessly disposed faecal material become a source of contamination in form of run-offs. Faecal material scattered in open spaces, alleys, road side is a common phenomenon in Kampala. The poor sanitary conditions in Kampala are manifested in the frequent outbreaks of cholera, water borne and related epidemics like dysentery, bloody diarrhea (Box 3). People are in constant contact with pathogens especially in the poor neighborhoods.

Since user pressure in many cases is great, the latrine quickly fills up. Some owners solve this problem by opening an outlet pipe, releasing excreta into the environment (Matagi 2002). Outwash also occurs during floods, so that excreta find their way to drainage channels and ground water. In some cases people are hired to manually empty the content of the latrines into the drainage channels. The sum is a very unhygienic water environment, with obvious danger to drinking water sources. Protected and unprotected springs are usually found at breaks of slope between the hillsides and wetlands, where the ground water table is close to the surface. As is the case of one of the protected springs, there are often dwellings with pit latrines on the upward slopes. A Rubaga division official stated that even though a lot of money has been invested in the protection of spring wells, they are still unsafe for domestic use due to ground water pollution (FGD 2005). But the problems of poor sanitation exacerbate the pollution of water sources in the city and metro area.

Box 3: Environment and Health Kampala

A case study has been done Kawempe Division with particular reference to Bwaise II parish. The parish is faced with three environmental problems: waste water disposal, garbage disposal, and human waste (feaces) disposal. This study has demonstrated that poor excreta disposal, inadequate safe water and a low level of community initiatives at household level as the most extensive and persistent environmental health problems in Bwaise II Parish. There is no clear drainage system for waste water from households. Over 70% of the waste water has no proper drainage system (SCF (UK), 1998).

Disease prevalence in Kawempe Division is closely linked to environmental conditions (Table 4.10). Rainy Seasons and other environmental factors are important in determining the pattern of diseases. The highest incidence of malaria's directly related to the rainfall pattern i.e. March-May and September-November when flooding occurs. The environmental causes are stagnant breeding grounds, poor sanitation, lack of proper latrines poor garbage disposal, poor drainage, poor housing, among others (SCF (UK). 1998:5).

Table 4.10 : Prevalence of Environmental Diseases at Kawempe Health Centre January-March 1998

Case	January	February	March	Total	Percentage
Malaria	432	236	191	859	27.6%
Acute respiratory Infections	230	251	196	677	21.7%
Diarrhea	219	154	129	502	16.2 %
Sexually transmitted infections	103	91	102	296	9.5%
Malnutrition	9	19	9	37	1.2%
Skin diseases	36	60	61	157	5%
Intestinal worms	44	75	68	187	6%
Trauma	41	65	95	201	6.5%
Others	70	87	40	197	6.3%
Total	1184	1038	891	3113	100.00%

***Source**: SCF (UK) Kawempe Primary Health Care Project, April 1998:8.*

6.7. Proposals to handle Environmental Degradation

As environmental management is at the heart of sustainable development, KCC authorities need to put in place concrete/viable measures to handle the various environmental problems associated with population growth and urban development. The most serious and visible environmental problem facing KCC is solid waste management where only 40% of the generated waste is collected and the balance is left to rote on the surface or dumped in drainage channels etc.

KCC should privatize solid waste management and devolve responsibilities to the community through LC.1. Let the communities through their LCs form CBOs, NGOs and private companies responsible for solid waste management. Those contracted to collect garbage should be answerable to the communities and KCC should play the advisory and supervisory roles. The communities/population should be sensitized on the need to have a clean environment and payment for the services as environmental education is integrated in the curriculum by (MoES). Through LCs, communities/individuals should be taught the sorting of garbage, reuse and recycling so as to have less garbage being transported to the landfill.

KCC should team up with the private sector and set up a biogas plant for the generation of electricity from the garbage since most of the solid waste is vegetable matter. KCC should sensitive and encourage the communities to undertake in urban farming especially of zero

grazing, vegetable and flower gardening. This activity should use the biodegradable wastes as manure and feeds.

The policies on solid waste management should be updated and made relevant to the prevailing conditions. They should be enforced with minimum political interference. KCC should get more land and construct modern landfills not the current dumping sites which are close to human settlement, streams and wetlands.

Sanitation and public health need to be handled urgently to avoid disease outbreaks like cholera, typhoid etc. KCC through National Water and Sewerage Corporation should increase on the coverage of piped water and sewerage services. This will assist the communities through CBOs, NGOs and private sector set up waterborne toilet facilities which are paid for by users. LCIII authorities should mount pit latrine campaigns and landlords should be forced to have enough clean latrines. The supervision should be a routine exercise by having an officer responsible for sanitation at the different council levels.

As a result of rapid population growth and development, wetland degradation is yet another serious environmental challenge facing KCC. Wetlands in Kampala are occupied and converted for settlement and agriculture with impunity. KCC should demarcate and gazzette all wetlands within its jurisdiction, sensitise the population on the importance and need for wetlands. The laws and regulations governing wetland use should be streamlined, harmonized then implemented and enforced. KCC should work hand in hand with NEMA and Wetland Inspection Division of the Ministry of Environment and Natural Resources to enforce the regulations and continuously inspect the wetlands. Wetlands which are already degraded should be restored and all illegal developments removed. Political interference should be stopped.

In Kampala only 55% have access to piped water while the rest, use either boreholes, wells springs or streams. All these water sources are threatened with pollution form industrial, commercial and residential developments. KCC should liaise with NWSC to increase on the distribution of piped water especially to the high density settlements. NWSC should endevour to overhaul its water pipes which are old and leaking and liable to distributing contaminated water. Protected springs should be constructed away from pit latrines. Through the Local Councils (LCI), CBOs, NGOs the communities should be sensitized on the values of consuming clean water and dangers of contaminating water sources. The communities should police their own water services. These measures if adopted will go along way in improving the living environment for the city residents.

CHAPTER SEVEN: COPING STRATEGIES AND POLICY NEEDS

7.0 Introduction

Given the preceding discussions and highlighted environmental burdens, the population of Kampala especially of the low income has devised strategies of dealing with the social, economic and environmental challenges. This chapter discusses the coping strategies some of which have been highlighted in the preceding sections and possible policy actions for sustainable urban development. Policy guidelines form an important part of government mandates for development and service delivery. In Uganda, policies are proposed by ministries, passed by parliament as national guiding principles and implemented by relevant ministries at different levels of administration. In the context of this research, policy alternatives are derived from the coping strategies since it's the strategies, which offer an understanding of underlying challenges for socio-economic development and environmental management.

7.1 Coping Strategies

The challenge of managing environmental burdens relies heavily at the household level to cope with accumulated wastes, water pollution, wetland degradation and resolving the poor sanitation. On the other hand poverty has polarized the city with pockets of clusters of poor neighborhoods scattered around the city and metro area. In the neighborhoods, the populations have devised livelihood strategies to cope with the burdens. The coping strategies of the urban population in Kampala are discussed in relation to the conceptual framework and VCM. This section presents coping strategies on three major issues economic, housing and environment.

Economic Strategies

Urban population growth associated with migration for economic gains has created a large group of job seekers in Kampala metro area. Unfortunately they cannot be absorbed by the narrow formal sector as most of them are untrained, untrainable and illiterate. These people have adopted different coping (survival) strategies as to remain in Kampala since going back to the rural areas is unimaginable (Box 4). Most have joined the ever expanding informal sector trade (Plate 7.1) either as self-employed or employees while many engage in odd illegal activities for a living such as drug trafficking, robbery, pick-pocketing and prostitution(Nyakaana 1999).

The other economic coping strategies include urban agriculture (Plate 7.2), waste recycling and reuse (Plate 7.3). As observed by Hovorka (2001) urban agriculture has become a wide recognized form of livelihood for many urban dwellers across all social strata. But women play significant roles in urban food production and contribute to both urban household and market economies. Innovative space utilization has enabled urban agriculture to thrive in Kampala taking advantage of wetlands, road islands, space-confined technologies for crop and livestock farming. However these activities impact differently on the environment. But the most serious and notable negative impacts are associated with pollution, waste generation and congestion (Box 4). On the other hand there are some innovative livelihood strategies that are attempting to improve the environmental conditions through recycling and reuse of wastes especially the plastic waste stream (LAVLAC 2005). As shown in plate 7.3, a women's group in one of the high-density low income neighborhood, has build capacity among the women of the area to turn environmental burdens of accumulated plastic waste streams into a livelihood. This technology is now spreading in various urban neighborhoods and out of such coping strategies, a women's

crafts market has emerged and rotates around the city but most notably in the center of the city at the Constitutional Square Plate 7.4.

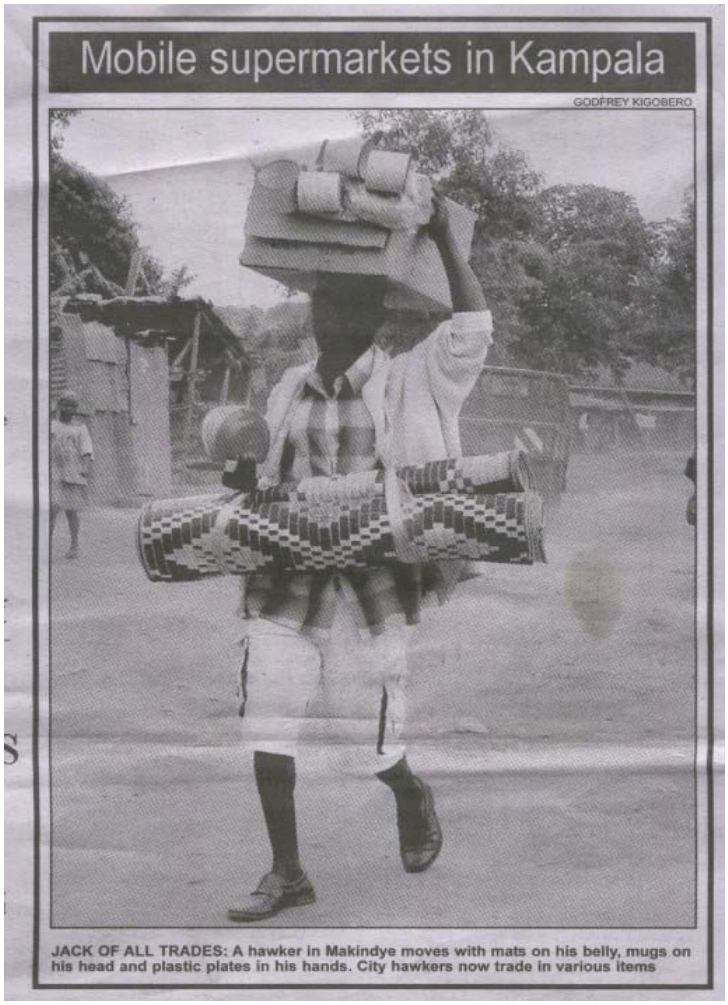


Plate 7.1: A hawker carrying his trade goods. A common survival strategy in Kampala

Plate 7.2: Livestock farming and waste generation

Plate 7.3: Berna Nanyonga (left) of KWI displaying their products from plastic wastes

Photo courtesy of Kyanja Edible Neighborhood Secretariat, KCC

Plate 7.4: A women's Craft market at the Constitutional Square

Housing Strategies

As the world becomes increasingly urban, it is essential that policy makers understand the power of the city as a catalyst for national development. Cities should be able to provide inclusive living conditions for all their residents as very person has a right to live in a city. It is also the right of everyone to have a decent living environment, clean water and sanitation, transport, electricity and other services.

Most urban migrants face the challenge of housing themselves due to lack of immediate employment and resources to acquire land for housing development. The current national policy of 'enabling environment' makes housing an even more challenging task for many households in the city. Coupled with an inefficient urban land market, the poorer section of the population have been pushed to marginal lands which are mostly wetlands where relatively cheap land can be acquired in as small area units as affordable by the buyers. Subsequently housing provisioning has continued through self-building, self-help in some situations and largely taking advantage of site-based resources for bricks and other building materials. This explains the continuous brick making that is common around the Kampala metro area. Additionally, brick-making sector has also attracted many unemployed youths, men and women as their livelihood strategies. Due to limited financial resources, many house builders are only able to start with one or two rooms and many spend their lifetime in such housing. This explains the dominance of tenements in poorer sections of the population. Associated with the household demographic dynamics, housing remains inadequate due to limited space since household sizes of five are housed in one or two rooms. The environmental challenge ushered in by this coping strategy has mainly been clearance of wetlands for cheap land for housing.

Coping Strategies for Environmental Burdens

As noted earlier, Kampala's big proportion of the population is beset by serious environmental burdens including flooding, solid waste accumulation, poor environmental sanitation and degradation of the natural environment. The most serious of these burdens are flooding and solid waste accumulation. Communities have creatively developed coping strategies to deal with flood mitigation. Since settlement of the urban poor is mainly in wetlands, infilling using all available materials including; solid wastes and earth are utilized to reclaim parts of the wetlands to enable house construction. On the other hand wastes and earth bags are also laid around the house to prevent floodwaters reaching the houses. As shown in plate 7.5 and 7.6, earth/waste bags are used as cushioning layers against floodwaters. However these coping strategies only mitigate floods to the immediate house but access in the neighborhood remains a serious problem additionally, the earth/waste bags add to the pollution nuisance in the communities

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Plate 7.5: Use of Earth Bags against flood waters in a wetland.

Plate 7.6: Waste Bags and associated consequences

Coping strategies	Impact on Environment
Production:	
• Urban agriculture	- wetland degradation - pollution
• Metal and wood fabrication	- congestion - waste generation, pollution
• Tin smith and key cutting	- congestion, waste generation
• Tailoring/cloth making	- congestion - pollution,
• Cooked food production/sale	- waste generation, congestion, disease spread
• Local/traditional drinks	- waste generation - alcoholism, congestion, disease spread
• Soft drinks bottling/packing	- waste generation - disease spread, congestion
• Brick making	- wet land/land degradation - pollution
Retail Services	
• Second hand clothes	- congestion/waste generation
• Uncooked food stuffs	- waste generation, congestion
• Non-food stuff products (manufactured/traditional)	- congestion
• New papers/stationary	- congestion, waste generation
Modern Services	
• Vehicle repairs	- pollution, wetland, degradation waste generation, congestion
• Watch and electrical repairs	- congestion, waste generation
• Hair Saloons	- waste generation, disease spread
• Motorcycle/bicycle transport (bodaboda)	- congestion
Petty services	
• Shoe shine boys	- waste generation, congestion
• Hand cart transport	- waste generation congestion
• Head porterage	- congestion
• Washing clothes (dobi)	- pollution, congestion

Box 4 Coping (survival) strategies and their environmental impacts in Kampala.

7.2 Policy Needs

Building on the Brundtland report entitled *Our Common Future*, which was published in 1987, sustainable development is "to ensure that development meets the needs of the present without compromising the ability of future generations to meet their own needs". Recognizing the current discourses on the concept of sustainability in various literature (Enyedi 2003; UN 2005; UNDP 2005), sustainable development needs to be coupled with easing of urban poverty. While it is difficult to measure the needs of future generations, its important to reflect on how the ecosystems have provided, regulated and supported societies sustainably (Walter V. Reid 2005). Thus policies are needed that address social well-being but maintains the basic services from the ecosystems. This section builds on the discourse in previous sections to derive policy recommendations for sustainable urban development.

7.2.1 Urban Governance

Urban governance is at the centre of consideration due to the growing social and environmental conflicts in urban systems. Governance concerns how organizations of the governments (local governments, national government agencies) and those of local civil society (various social groups), relate for the harmonization of their activities, and the distribution of labour among them. Whereas earlier urban policy and planning used to be the privilege of political decision makers and technocrats, it is generally recognized that the solution of urban social and environmental challenges requires the participation of social groups and their organizations. At the same time, the local social movements and organizations have become stronger due to changes in organization, advocacy and public recognition. For example the decentralization of services and roles i.e. by transferring part of the decision making power from the central government to the regional or local ones, service delivery is improving with participation of the society. In Uganda decentralization has improved transparence, accountability and increased investment through projects identified and prioritized by the local population. Although this improvement is laudable, governance still need to be improved by fully engaging the urban communities, moving from technocratic to socio-cratic planning, massive education and inclusion in decision making if sustainable urban development would be achieved. Besides investments in infrastructure, the organization surrounding such infrastructure needs to engage the public in the planning and execution of investment projects. The environmental movements have played a significant role in organizing grass-root society, as their activity was directed to local problems and thus they were able to mobilize people for a common action. Good urban governance shapes co-operation between the local government and grass-root society according to the characteristics of the given problems. In this context, grass-root mobilization is one such policy requirement for improved governance of the urban development process and environmental management. For example greening efforts, waste management alternatives all require grass-root mobilization. Already some grass-root initiatives are showing the means through which mobilization and influencing change in their communities in regard to environmental management can be achieved.

7.2.2 Urban Social Policy

As observed by (Enyedi 2002), the quality of governance depends on the quality of its two co-operating elements, i.e., of the formal institutions of the government and of the self-organising units of society. Building on (Putnam 1993) works, the term "social capital" was introduced to be interpreted social capital as something based on the characteristics of social organizations, like trust, keeping to the rules, strength of internal relations, as these help in acting in a co-ordinated way and in making the society function efficiently. From this point the accomplishment of environmental management at citywide level would depend on the quality of social capital. Urban policy would help in reinforcing social capital. This can be promoted by organizing and/or maintaining or supporting – or providing urban space for – events and institutions which

make it possible for the different strata of society to meet, to get acquainted with each other and to have discussions(Enyedi 2002). But the social organizations need to be fully engaged in civic activities such as advocacy for their entitlements and requirements. The fact that existing grass-root based organizations are beginning to play advocacy roles implies a policy requirement to support the progress of advocacy and civic engagement. Such civic engagement though challenging on the part of the city authorities due to the opening up of civic space, can be avenue for management of urban development and environmental sustainability.

7.2.3 Planning Policy Issues

Planning as an intervening factor in addressing environmental problems needs attention for sustainable urban development. Although planning has been in existence since the turn of the 20th Century, its impact on urban development has not been adequately felt. This is due several reasons including political interference, inadequate personnel, and institutional and legal framework weaknesses. Room for improving planning exists and two issues need to be stressed here. First the move from technocratic to socio-cratic type of planning in the city would make headway in addressing the environmental and urban development challenges. Such sociocractic planning involves the stakeholders and deviates from the 'traditional' largely office based planning by technical personnel. The second issue is the need for strategic planning for urban environmental management in metro area of Kampala. Realizing the expansion of the urban functional space that is spanning in areas under different local governments, metropolitan strategic planning needs to be undertaken if the urbanization of the region would be sustainable. The 1994 structure plan is the most recent and binding guide for development in Kampala, some critical policy issues within the context of environmental planning can be identified as below;

- Formulating an Urban Environmental Management Strategy (EMS) covering environmental aspects of the 'Brown Agenda' and Valued Environmental Components (VECS)
- Management of VECs which include; wetlands, Fisheries, Acquatic resources, Biodiversity, water resources, vegetation and open, wild life, land and soils resources, air quality; and heritage, tourism and cultural resources is very crucial for sustainability in Kampala. This would be carried out within a broad context focused on sustainable development. The major wetlands in and around Kampala warrant significant attention during the planning process. Water resource conservation and quality management for public health improvement is also recognized as a critical issue that can be addressed by the planning process. Additionally, forests, wetlands and agricultural activities require proper management for managing water quality. This would involve greening policies, hill-top and catchment conservation.
- Land still remains a critical issue in planning due its duality of being an exchangeable commodity and yet it is also a resource for production. The issue of land and the land market has rendered fragile and environmentally sensitive areas such as wetlands commodities and thus contributed to their destruction. Although the written provisions recommended a On-Stop Shop for land administration and transfer, little has been done to streamline the activities making it difficult to manage land in Kampala(Uganda Government (2000)). Of late KCC has recognized the need for planners at divisions and recruited planners at these levels. But the inadequacy of planners and the overwhelming planning work has played a significant role in creation of the current imprint of developments in Kampala

Currently no one knows the proportion of the 1994 structure plan that has been implemented. There is continuous debate and disagreement as to whether politics or planning failures and or financial problems have lead to general failure of the plan's implementation. Developments are

mushrooming as and when developers decide and although efforts from KCC to stop such illegal developments are manifest, the pressures that developers have put on the environment are enormous. But the issues of institutional weaknesses in addressing environmental management concerns, financial resources, lack of awareness about environmental factors, inadequate laws, lack of political will and lack of baseline data significantly undermine environmental management within the context of urban planning (Norstrand, Development et al. 1994). Therefore a framework for proper management of environment that integrates environmental issues in urban planning and development policies is necessary to address the current population changes development and environmental linkages and feedbacks.

7.3 Population Policy Issues

In Uganda the population policy is an integral part of the national development policy and not a substitute. It complements and promotes the overall development goals of the country and is cognizant of other sectoral policies and programmes. Specifically on population growth, distribution and unification trends the following policy principles were advanced. -

- Reflecting population concerns in development planning at all levels.
- Respond to the impact of past population phenomena on the economy society and aims at influencing future demographic trends and patterns especially fertility, mortality and migration.
- Recognise and take into account the existence of marked district variations with regard to population issues and development.
- These principles were guided by the following goals.
- Integrated rural – urban development and a more balanced urban growth and spatial population distribution.
- Functional integration of population and related socio-economic factors in national, sectoral, district and lower level planning.
- Elimination of negative socio-cultural practices and inappropriate laws.
- A society that is both informed and conscious of population and development issues
- ***Demographic targets:*** Reduction of infant mortality (122 to 112/1000), any children (93 to 85/1000), maternal mortality (500 to 330/100,000 live births, total fertility from (7.1 to 6.5), increase life expectancy to 53 years for both sexes.
- ***Health services targets***: Increased immunization (31% to 62%), supervised deliveries (38% to 76%) and contraceptive use rate (7.8 to 15%.
- ***Social services targets***: Increased education rates especially for females 13 – 24 years (12% to 18%), increased literacy rates (40% to 60% females 60% to 80% males), increased provision of safe drinking water (18% to 36%), Reduce population of families without toilets (29% to 14%).

Having set the goals, objectives and targets, strategies and programmes of activities were put in place.

- ***Family Health:-*** This was to be achieved through promotion of integrated MCH/FP where male involvement was enhanced and the legal minimum age for marriage was set at 18 years. Intensified prevention and control of the HIV/AIDS epidemic through increased community awareness and mobilization, behavioural changes (sexuality marriage, cultural practices), counseling, detection and treatment of STDs, providing and encouraging use of condoms, encouraging HIV testing, promotion of research and training.

- ***Education:*** Both formal and informal education were to be encouraged through UPE, creating opportunities for school dropouts, special education for persons with disabilities, establishing population and clubs in educational institutions and community, encouraging girl-child education, integrating population and family life education into the curriculum.

- ***Labour force and employment:-*** This aimed at strengthening comprehensive manpower and employment planning and its implementation through strengthening and developing technical managerial and entrepreneurial skills, promoting and emphasising vocational and technical education aimed at job creation, promote female participation the formal sector, increase productivity, reviewing and enforcing labour laws and integrating family life educational into the formal labour sector.

- ***Migration and urbanization***: Ensure optimum utilization of land by promoting balanced regional and district development through appropriate land tenure systems, integrated rural and urban development, planned urban growth, creation of employment opportunities both in the rural and urban areas and encouraging growth of small and medium-sized terms through decentralization and encouraging remittances for development purposes.

- ***Housing and related services:*** Create an evolving environment (social, financial, political, economical regulatory pr parents) for households, firms NGOs and community groups to provide adequate, affordable shelter as to promote social development and improved quality of life.

- ***Food and Nutrition:*** Promoting and sustaining increased food production and land productivity through soil and water conservation practices, high yielding, quick maturing and disease resistant plant trains and animal breeds, better pricing and marketing system, appropriate technology at all levels (production, storage, distribution), food and nutrition policy, research, training and extension in agriculture food and nutrition.

- ***Environment***: Increased awareness on the impact of population change on environment through environmental education campaigns, conservation laws, proper waste management, discourage traditional land inheritance practices, promoting research in use of alternative sources of energy and energy saving devices.

- ***Women in development:*** sensitizing the public on gender issues, health and economic benefits of safe motherhood and planned parenthood, increased female enrollment in educational institutions, review, enact and enforce laws which protect and raise status of women, use of appropriate and energy-saving technology to reduce female work load, setting up day care centres to allow women participate fully in socio-economic activities and promote research on women in development.
- ***The role of men in family welfare:*** Sensitize men on gender issues and the promotion of their spouses and children welfare, promoting self-reliance among men and prevent poverty through increased food and cash crop production; reviewing, amending and enforcing the Affiliation Act.

- ***Children, Youth, Elderly,*** Persons with disabilities: Sensitize the general public on special needs, rights and responsibilities of these specialized groups, setting up and strengthening community based support for the displaced, disabled, street children, orphans, delinquents; increase social and economic opportunities for them, support to specialized government organization, centers and needs; enact and enforce laws that protect these groups.

- ***Social Cultures and Legal Issues:*** Sensitising all categories of leadership on the relationship between law and population issues, reviewing existing laws customary practices and enacting new ones that have a direct bearing on population issues, marriages, property ownership, rape and defilement.

- ***Data collection, research and training:*** Strengthen all data collecting organs of government through training, facilitation; reviewing, enacting and enforcing laws and regulations and establishing a forum for population and data producer – user communication.

- ***Information Education and Communication (IEC):*** promoting the establishment of national IEC strategy on population and development issues, strengthening the capacity of line ministries, districts and institutions to produce IEC materials in local languages, establishing and strengthening existing population information networks, use of traditional communication channels revitalizing the mobile film units, training, and IEC research in the field of population and development.

As these policy issues cannot be handled wholesome, they need to be prioritized and the following are proposed:

- ***Education***: Introduced family life education at all levels of education. This will aim at family planning, food and nutrition, environmental education. This should be done by MoES through a change in the curriculum. NGOs Local Government (LCI – LC5) and CBOs should also participate through informal education of the masses.

- ***Updating Population data***: Updating of population data demographic characteristics should be a continuous process by the Population Secretariat. The data collected should be sent to the MoFP&ED for national planning and to local governments for district planning.

- ***Environment:*** Protection of the environment is vital for sustainable development. Environmental education should be introduced in schools by MoES while NEMA and Ministry of Environment and Natural Resources handle it beyond school level. NGOs and CBOs should be facilitated for environmental education, demonstration and implementation at different levels.

- ***Migration, urbanization and housing***: whereas migration is contributing to the rapid urbanization and consequently problems, both the central government and local governments should control it by improving on quality of life in rural areas and stimulating urban development of the intermediate urban centers like Mbarara, Jinja, Mbale, Gulu, Arua etc. Industries, hotels, government services like education, tertiary institutions, referral hospitals, security headquarters should be decentralized from Kampala.

Government should put in place policies that will attract the private sector from Kampala. On housing, KCC should integrate and enable empower the informed sector through clear land policies, financial empowerment, education and training and reduce on bureaucracy.

7.4 Policy issues on solid waste management

Policy on solid waste has been inadequate. The law which has been bearing on solid waste management is "The Public Health Act" 1964. It gave urban authorities monopoly over collection and disposal of solid waste generated in their areas of jurisdiction. Others policy documents which handle the solid waste component are:

- The Public Lands Act 1969
- The Pharmacy and Poisons Act 1981
- The Agricultural Chemicals Statute 1989
- The National Wetlands Policy 1995
- Natural Environment (waste management) Regulations 1999.
- The Local Government Act 1997
- Kampala Solid waste Ordinances

Whereas these policies are in place the main problem has been their implementation and continued political interference (Plate 7.7). Solid waste management is an important area to consider in the context of urban planning and environmental management. The plan recognizes the need for a concerted effort in managing of solid wastes. This will involve sensitization, education and training of t he public in managing solid wastes. Innovative ways of managing wastes such as composting for urban agriculture can also be encouraged and this would galvanize the recently revised urban agriculture ordinances of Kampala. Solid waste management, policies should devolve powers to the communities and local councils (LCI – LC5). The policy should be clear on who should do what. Let the communities through their LC administration be empowered to handle their waste. The communities should work hand in hand with the private sector. Privitasition of solid waste management should be bottom-up and not the reverse. The private collectors should be answerable to the communities and should preferably be small scale community based collectors through CBOs not large companies as is the failing practice today. The la4rge companies are not answerable to the communities but KCC who award them the tender.

RAZE HOMES IN WETLANDS, GOVT ORDERS

PETER BUSOMOKE

WRONG CHOICE: Residences in Ntinda valley after Sunday's downpour. KCC says it will not compensate their owners for property lost to floods

BY ANNE MUGISA AND CATHERINE NTABADDE

THE Government has directed Kampala City Council (KCC) to demolish houses and other structures erected in the wetlands.

The directive from the Ministry of Water, Lands and Environment, comes after serious floods on Sunday, which ravaged buildings in some of the waterways and killed a girl in Rubaga.

State minister for environment Kezimbira Miyingo told journalists in his office that KCC had refused enforcing laws and regulations put in place to stop construction of the wetlands.

He said one of the regulations, which KCC has been pressured to put in place by the ministry and environmental organisations, is to engage a private agency unlikely to be corrupted, to evict encroachers and demolish the structures.

"We talked with the mayor to look for private enforcement agents who cannot be bribed to evict people and demolish the buildings at a cost, but the Council rejected the idea. We have told them that they must demolish them," Miyingo said.

The assistant commissioner for wetlands, Paul Mafabi, said the minister is yet to draft a formal directive to KCC.

Miyingo said over 60% of the city wetland had been destroyed by encroachers who include factories owners.

Turn To Page 2

Plate 7.7: Government stand on houses constructed on wetlands policies

Note: Though government stand on protecting wetlands is positive, political interference and lack of good political will make implementation difficult.

7.5 Policy issues on social infrastructure and public services

Social infrastructure (schools, hospitals, community houses) and municipal services (public utilities, public transport, telecommunication, waste management) are of vital importance for sustainable development of cities. These are essential economic and social factors for attracting production capital. When this capital is lacking, the urban economy translates into social distress. On the other hand due to unreliability of the electric system, the industrial and commercial businesses are using their own generators, which have significantly increased both their investments, their running costs but more importantly pollution through CO_2 deposition. The other problem is that certain social strata access municipal services with difficulty, if they exist. The poorer communities who live in the peri-urban areas of the city, have minimal public utility services, health service and educational institutions are lacking, while public transport is inefficient. Although the current decentralization process is improving the situation, urban communities are mobile and spend a lot of time in circulation. This implies services and infrastructure need to be in place for enabling the proper functioning of the urban population. The tax income of cities is usually not sufficient for larger scale infrastructure development, and the widespread privatization has led to rising prices deteriorating the situation. As a result, the number of families unable to pay for the public utility services has been increasing. Thus policy is needed to address social infrastructure and services including an efficient and effective management of human wastes, which pose challenges for the city authorities. The polices of decentralization and privatization need to mainstream local labor and involvement in order to

reconcile the market prices with publicly allocated investments which tend to be higher in most cases. This can be linked to community contracting which would offer double-edged opportunities of job creation and improvement in social infrastructure and services

7.6 Urban land use and housing policies

Controlling urban land use and housing policy are crucial issues of city management. It is the functioning of the real estate and housing markets that make it possible for families to choose their residence according to their needs, thereby becoming members of the city community. Proper control of the use of urban space contributes to the environmental sustainability of cities if land and housing markets are promoted to efficiency. Because of deregulation the consequence has been less government interventions. This happens despite the fact that social inequalities are strong and poverty has appeared in a new, extreme form, namely in that of social exclusion and urbanized poverty. Its spatial appearance is housing segregation: at one end the upper classes in their separated and guarded gated settlements, at the other crowds of homeless people (who are excluded from the housing market). Although urban policy cannot eliminate these phenomena, depending on its knowledge, political attitude and means (competence), it can be improved or worsened. Housing policy and construction regulations – sometimes consciously, sometimes only as an unwelcome consequence – can significantly influence social segregation or integration. Construction regulations, on the other hand for example by prescribing the minimum size of a plot or a house, or the public utility requirements, automatically excludes the poor from certain areas of the city who could undertake to build simple, cheap houses. This is manifest in the sustained encroachment on wetlands due to cheap land which allows besides owner-occupier but also rental housing for urban poor. Generally, the housing policies and physical planning need to be improved to deal with the issues of social and/or ethnic inequalities. The 'enabling housing' policy being pursued by government needs a review to consider more robust mechanisms of dealing with alternative building materials, minimum plot sizes, rental housing markets and semi-regulation of the land market in Kampala. It should recognise the important role of the informed sector in housing provision.

The policy to control the development of slums must be focused on Millenium Development Goal 7, Target 11, which aims at having significant improvement in the lives of slum dwellers. The policy must specifically address the impact of ever rising cost of house construction materials to the fight against substandard housing. It should also explore the benefits and challenges of financial institutions providing mortgage and housing loans and how to make these accessible to the urban populations. The policy should also provide an environment which encourages more private investment in low income housing. Once these and other factors have been understood and attended to, government should then have the will to follow them up to their logical end. KCC and the MOUD working in conjunction with Ministry of Lands and Environmental Management should take the lead in addressing a workable policy to control urban housing and land use.

7.7 Industrialization Policy

In Kampala industrialization has progressed supported by the earlier planning schemes and more recently the Uganda Investment Authority, which acquires land and allocates it to investors as a means of attracting Foreign Direct Investments (FDI's). The organization of an industrialization process needs to take into account transportation, public services, and land issues. Location needs to be compatible with proximate activities and thus industrial complexes, which are planned adjacent to residential neighborhoods, would be unacceptable depending on the type of industries. Among the specialized urban policies, industrialization policy might have the greatest indirect (and often not even presumed) impact on the spreading of environmental problems and social concerns. From the point of view of sustainability, the most important question is whether

compact/agglomerated industrial development is favoured. Consideration needs to be given to an option for industries spread over vast territories with efficient transport systems. The metropolitan transport policy can play a crucial role in industrialization. This calls for an industrialization policy, which takes into account environmental sustainability, social development and transportation. A less agglomerating industrialization policy would possibly create non-point source pollution but with mitigation measure, it outweighs the problems of agglomeration. Consideration of industrial development in wetlands also needs to be given serious attention I such a policy.

7.8 Poverty Reduction Policy

Urban poverty is one of the major challenges facing Uganda in general and Kampala in particular and needs to be handled continuously. The current macro-economic policies have failed to reduce on poverty levels. There is need for a more comprehensive strategy that focus on the informal sector. Understanding the evolving nature of the informal sector and facilitating its growth and transformation are very important.

The informal sector must be taken seriously as a major and expanding part of the urban economy – one that is entwined with the key processes of enabling, empowerment and informal income generation. The policy must ensure promoting opportunity, facilitating empowerment, and enhancing security. The powers to implement the policy should be devolved to the local authorities (LCI – LCIII) with supervision from KCC MoHUD aand MoFPED.

7.9 Integrated Urban Environmental Management Policy

Following the support available on the degradation of the environment and the nature and trends of such degradation in Kampala, several policy challenges can be identified. Te overarching policy challenge is the existence and enforcement of contradicting policies as the case of the Town and Country Planning Act 1964 which permits development in wetlands but the National Environmental Management Act 1995 restricts such development. The two are further contradicted by the Land Act of 1998 which stresses the ownership of land to individuals and institutions irrespective of whether such land is a wetland or ecologically sensitive area. These policies and laws need to be harmonized to ensure sustainable management of the urban environment. Associated to the need for harmonization is the requirement for urban greening policy, waste management policy and urban agriculture policy, which could offer support to urban environmental management through conservation. These policies need to address the sustainable utilization of land especially on hill tops while maintaining land cover that could mitigate flooding in the city. The greater benefit of harmonization would be integration of environmental issues in the various policies identified in this research.

CHAPTER EIGHT: CONCLUSIONS

8.0 Conclusion

The physical environment is a significant factor on the well being of people as it determines the quality and quantity of resources to be harnessed for national socio-economic development. However sustainable development depends on planned use of the resources. This is true for both rural and urban areas in both developed and developing countries. The study revealed that Kampala has undergone through a planning process since 1912 and the latest urban structure plan of 1994. The 1994 structure plan provided for an Urban Environmental Management Strategy to cater or sustainable utilization of the environment but unfortunately implementation has not been achieved. This has stimulated establishment of informal housing and other developments that have degraded the environment especially the wetlands. Failure to implement the plan has been due to several factors including;

- Inadequate financial and human resources
- Lack of political will and or political interference in the decision making process
- Conflicting land tenure systems
- Weak policies with inadequate enforcement mechanisms

It is therefore important to design new policies and enforce them for sustainable urban development. Any policy for sustainable development requires inclusion of population control measures.

As a primate city, Kampala is faced with rapid population growth, which is unevenly distributed among the administrative divisions. The population surpasses the available infrastructure (housing and social services), employment opportunities as the administration is under funded. This has resulted in many people adopting various coping (survival) strategies. Unfortunately these strategies are not planned for and this has resulted in congestion, informal housing, solid waste accumulation, irresponsible solid waste disposal, poor sanitation wetland degradation and water pollution. According to the Kampala Structure Plan some wetlands were gazetted for industrial development. This was unfortunate and it is increasingly becoming difficult to control encroachment on the wetlands not gazetted for industrial development.

The interaction between P/D/E clearly indicated that the rapid population growth and the associated developments through provisioning of housing, industries and the associated economic activities in a situation of failed implementation of urban structural plans impacts negatively on the environment. The negative impacts are felt through poor sanitary conditions, crowded/unplanned housing, floods, wetland alteration/degradation, inappropriate solid waste management practices, and water and soil pollution. All these need to be corrected if Kampala and Uganda in general is to sustain her economic development. This can be done through the enactment and implementation of policies and laws, which address the issues revealed through this study. This study set out to provide information needed for the enactment of such policies and laws.

As regards, pollution in Kampala, the loads indicate a growing problem, which needs quick attention by the city authority if the health and well-being of the population will be protected.

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Appendices

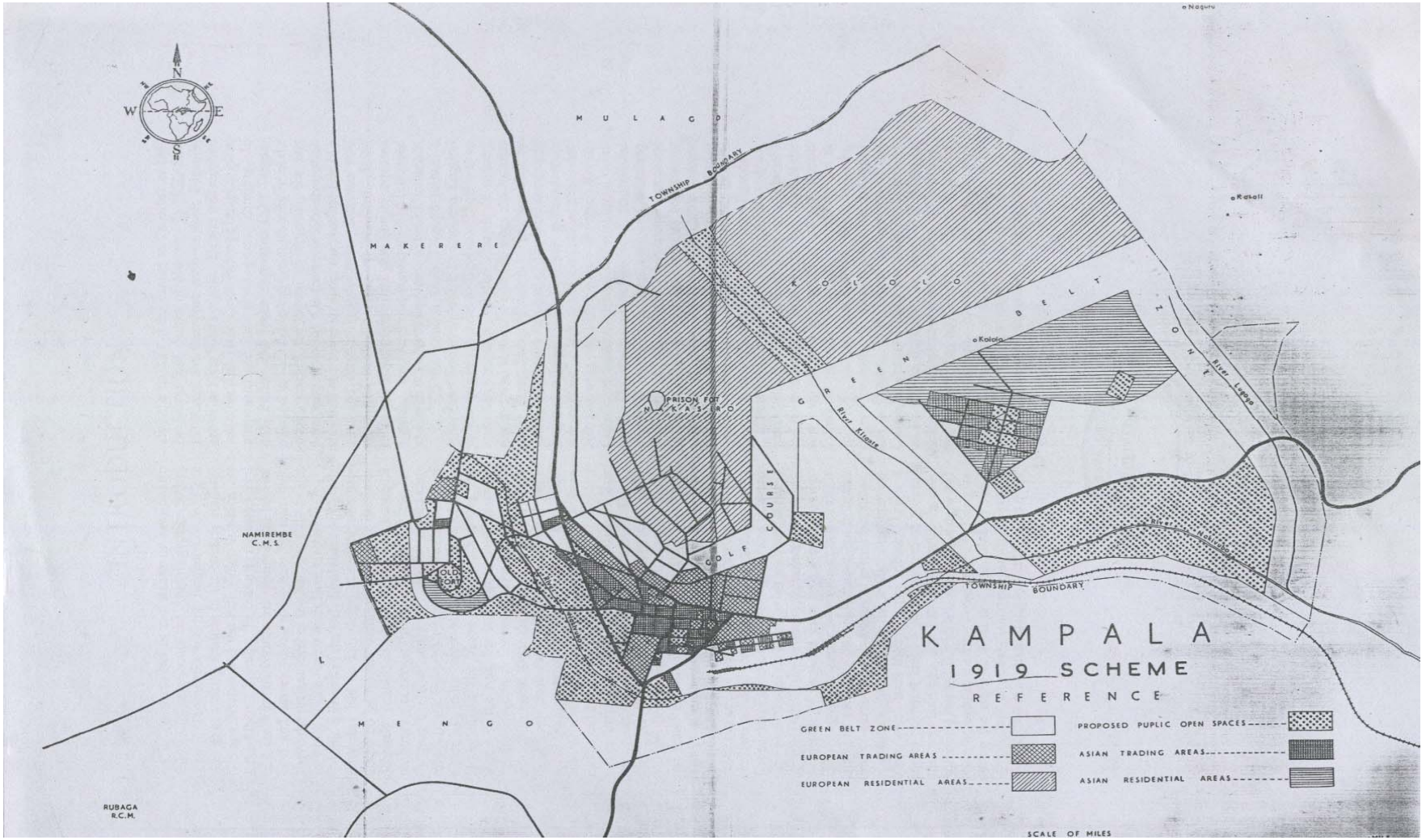
Appendix I: Ethnic Composition of Kampala District Population 1991

TRIBE	MALE	FEMALE	TOTAL
Acholi/Labwor	10385	9883	20268
Alur/Jonam	6240	5475	11715
Bachope	52	56	108
Bafumbira	6213	3675	9888
Baganda	217285	252397	469682
Bagisu	6251	5935	12186
Bagwere	1944	1613	3557
Bahororo	572	474	1046
Bakiga	12254	9516	21770
Bakonjo	1189	749	1938
Bamba	551	335	886
Banyankole	20276	18943	39219
Banyarwanda	5327	6834	12161
Banyole	1374	1163	2537
Banyoro	8433	9412	17845
Baruli	409	221	630
Barundi	646	580	1226
Basoga	13286	11821	25107
Batoro	14485	14648	29133
Iteso	12851	12745	25596
Japhadhola	3757	2582	6339
Kakwa	1427	1223	2650
Karamojong	633	369	1002
Kumam	1651	1544	3195
Langi	6113	6048	12161
Lugbara	5429	4307	9736
Madi	1583	1284	2867
Nubian	1764	1773	3537
Other Ugandans	2162	2036	4198
Samia	3973	3019	6992
Sebei	321	221	542
Total Ugandans	**368836**	**390086**	**759932**

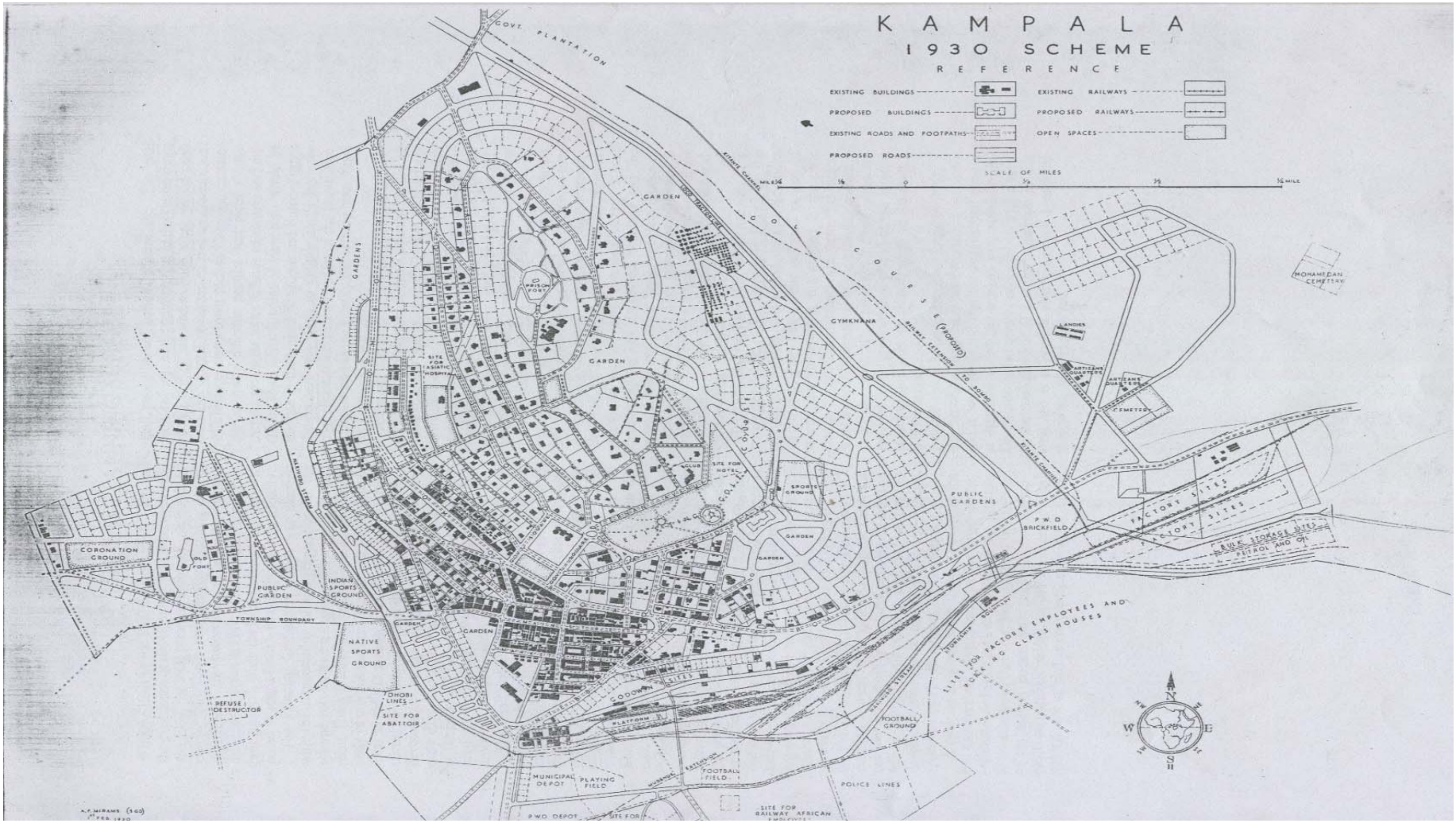
Source: Population and Housing Census, 1991

Appendix II: Kampala Planning Scheme 1912

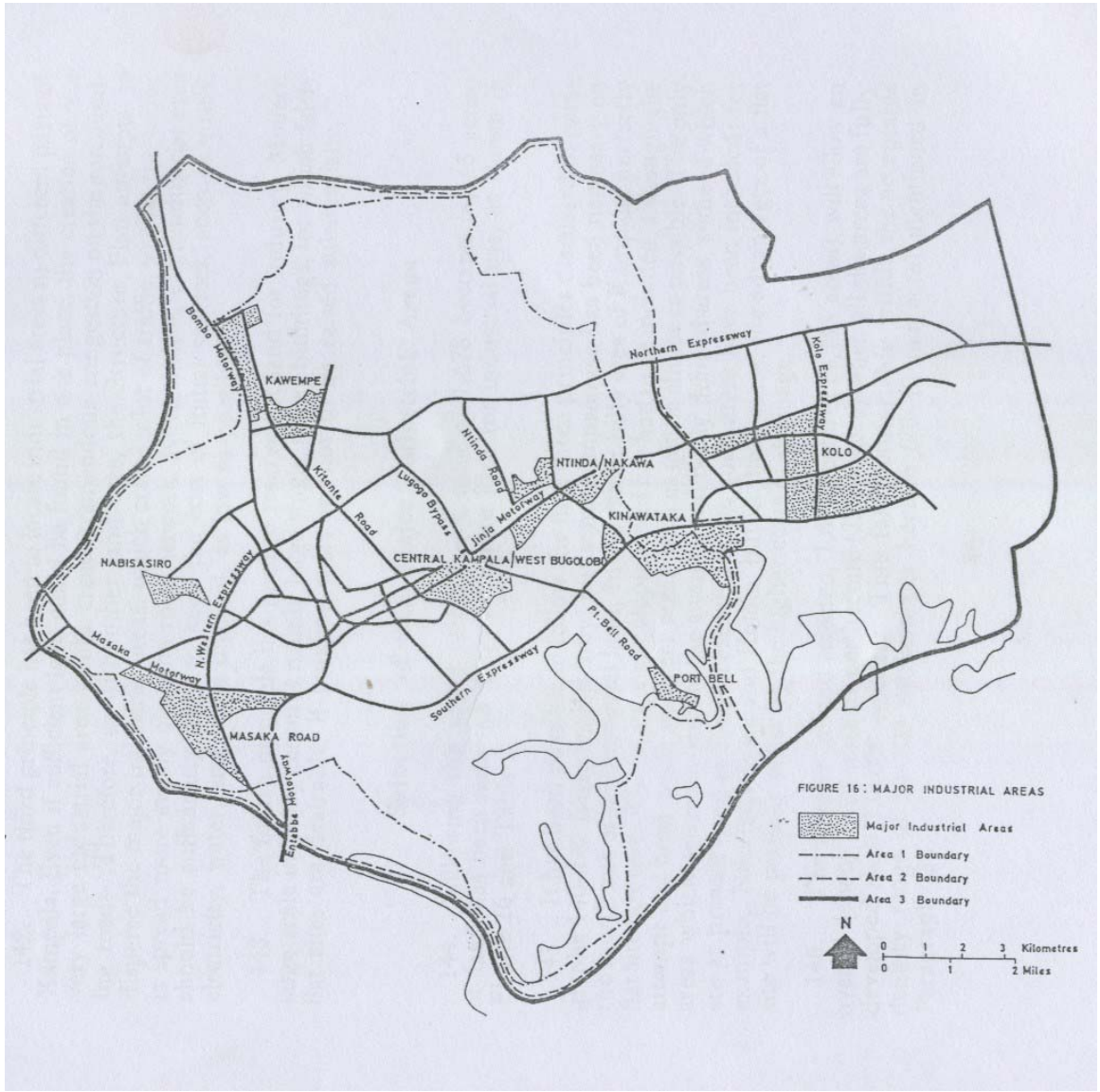
Appendix III: Kampala Planning Scheme 1919



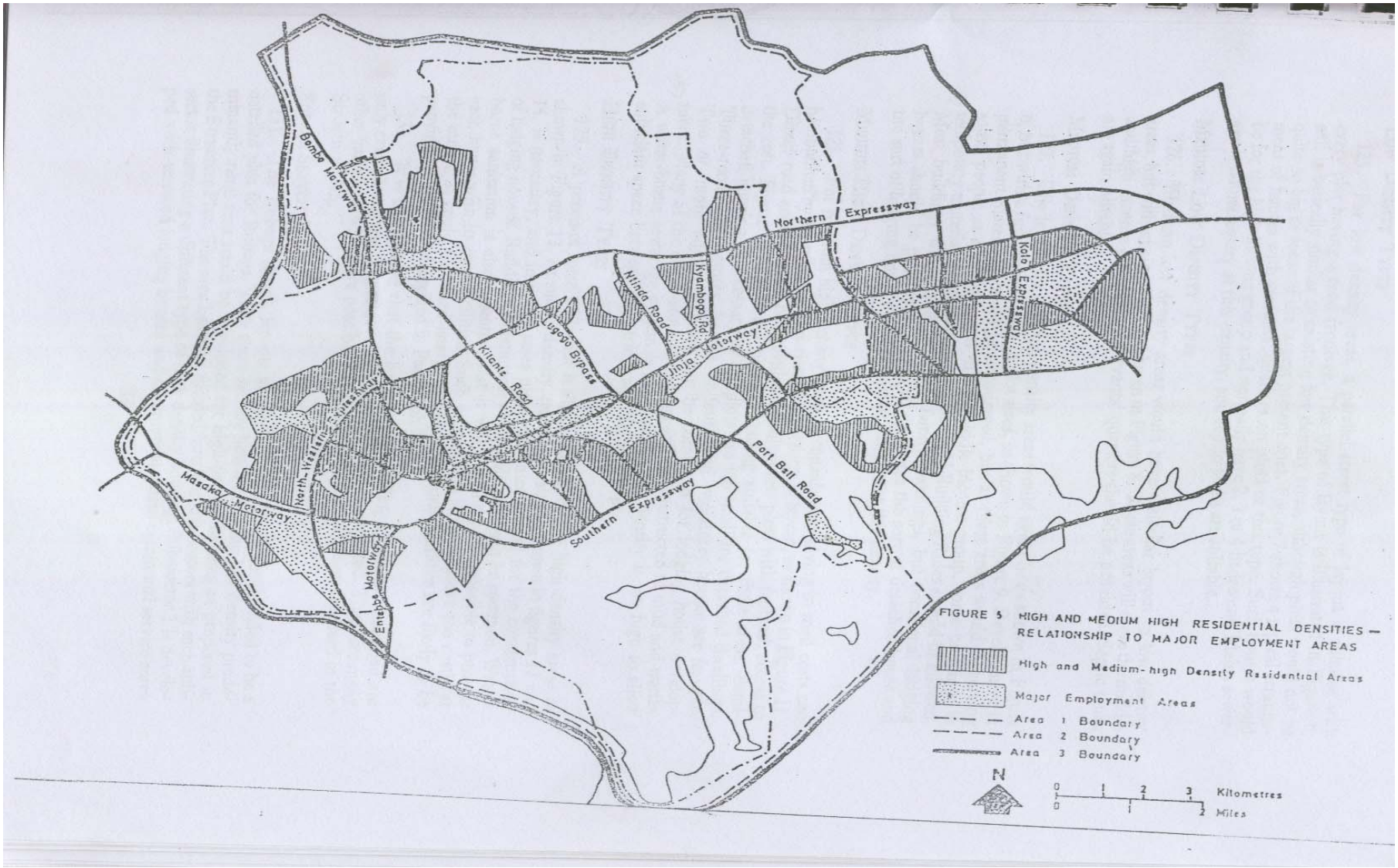
Appendix IV. Kampala Planning Scheme 1930



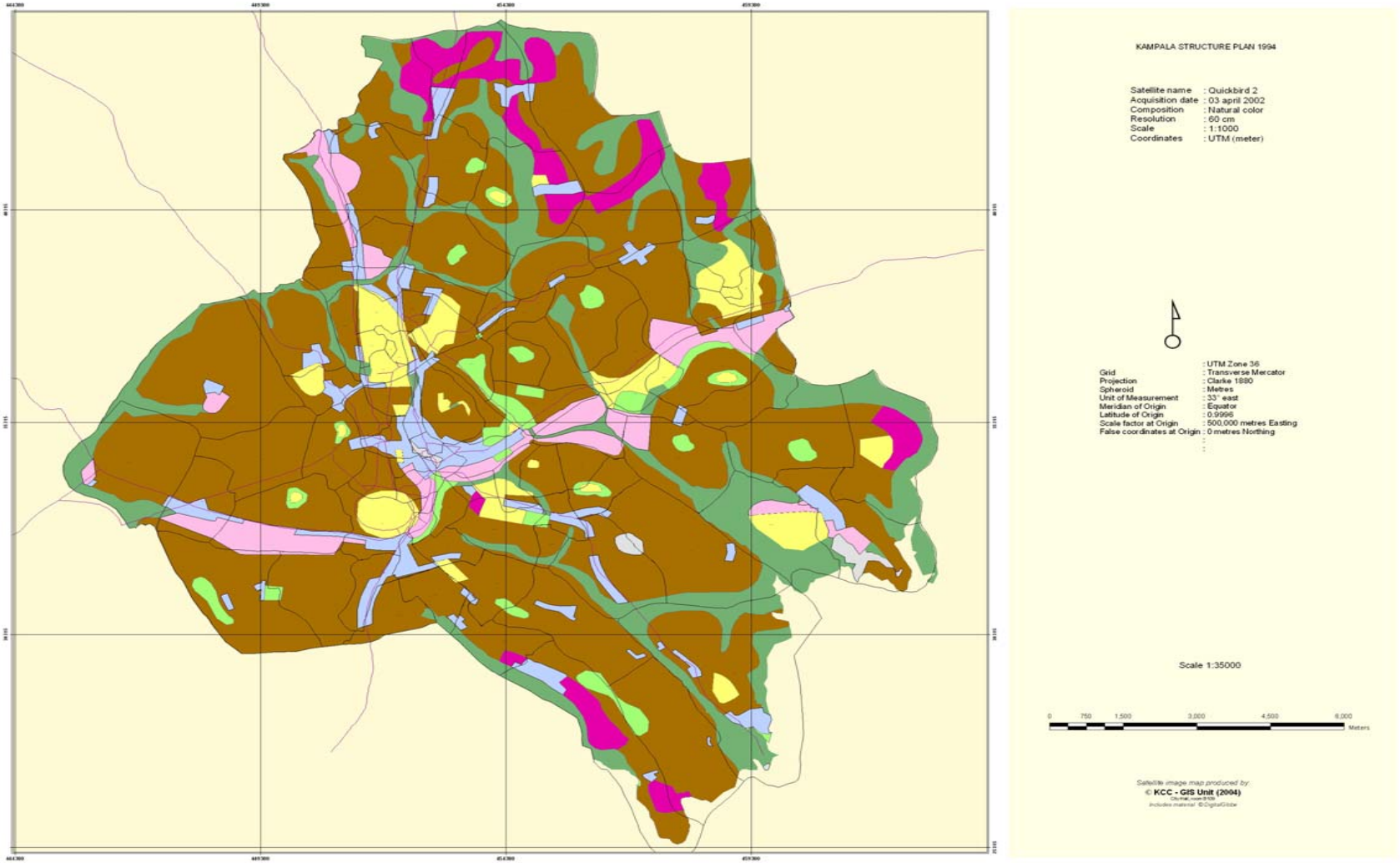
Appendix V: Industrial zones in the 1972 planning scheme



Appendix VI: Residential Land Use 1972



Appendix VII: The 1994 Kampala Structural Plan



Appendix VIII: Sources of wastes generated in Kampala

Domestic: Food and vegetable wastes, plastic and polythene, bottles and glass, paper, tins, metallic products, ashes, dust, stones, textiles, batteries, bones, rubber, broken porcelain and old clothes.

Commercial activities: Paper and paper products, plastics, food wastes, metallic products, wood wastes, textiles acids, used oils, grease, leather and rubber, glass and ceramic dust, human hair etc.

Industrial activities: Plastic , polythene, expired drugs, broken glass and bottles, batteries, paper etc.

Hospital, Clinics, Maternity Centres: Syringes, needles, used gloves, expired drugs, bandages, drug containers, used surgical blades, plasters, removed body parts (teeth), placentas, other toxic wastes.

Offices: Paper, plastic, dust.

Building, Contractors: Broken glass, paints, tiles, rusty metallic products, cardboard, old appliances, debris, bricks, cement products.

Schools and Colleges: Glass, used plastic tubes, acids, chemicals, old laboratory equipments, dust, food leftovers etc.,

Biodegradable wastes

- Organic matter of plant origin — wood clippings/pieces, banana, cassava, pods/covers, seeds, leaves
- Organic matter of animal origin — bones, feathers, dung, hairs, meat leftover
- Paper and fine materials — ash, sweepings etc.

Non-biodegradable wastes

- plastics (basins, cups, plates, bags, food and cosmetics containers).
- metals
- broken glass and oils
- dry batteries

Appendix IX. Policy, Legal and Institutional provisions relevant to solid waste Management

The following observations are common to most municipalities in Uganda as far as technological issue for waste management are concerned:

Waste characterization
There is no regular update/inventory on quantities of waste generated by source and/or category.

Waste collection
Collection facilities are inadequate and the few available are improperly used and are not accessible to the 'informal settlements.'

Waste reduction
There is no effort at all at waste avoidance and reduction. Although the Uganda Environmental Protection Forum, a local NGO has initiated efforts aimed at awareness creation for waste reduction.

Recycling

- The mode of disposal (aggregated waste) undermines potential for recycling. The current methods of disposal make it difficult to collect adequate volumes of waste that can justify investment in appropriate technologies;
- There is no link between waste generation and potential use for economic activities;
- Awareness on benefits of recycling is limited, while lack of appropriate technologies limits opportunities for recycling;
- Incentives for recycling are limited;
- Market for recycled products is limited

Transportation

- Inadequacy of trucks;
- Irregular and unguaranteed replacements;
- Lack of budgetary provisions for replacements;
- Poor road access to peri-urban neighbours. Such areas therefore require
-
- different and adapted mode of waste transportation

Land filling

- There are no limits but mostly dump sites;
- Dumpsites lack management to ensure proper operation;
- Dumpsites are poorly sited;
- There is limited technical capacity for appropriate landfill citing, design, construction, operation and post landfill development;
- There has hitherto been limited Environment Impact Assessment application and no specific guidelines for landfill development;
- Construction of ideal sanitary landfills is expensive and unaffordable to most municipalities

Incineration

- Limited incineration is practices – mostly by a few hospitals for clinical wastes;
- Incineration is expensive and not affordable for many municipalities

Source: NEMA/UEPF/JMC (1999)

Appendix X: Wetlands in Kampala District and its Environs in 2000

WETLAND NAME	AREA (Km^2)	TYPE=	LAND USE	THREATS
Kasanga	4.54	P.S	**Cultivation**, vegetation harvesting, sand extraction, hunting	Conversion
Kinawataka	4.16	P	Industrial development, **cultivation**, vegetation harvesting, **brick making**, canoe transport, sand extraction, hunting	Conversion, silting
Kawoya	0.52	P	**Cultivation**	Conversion, pollution
Kula	0.13	S	**Cultivation, brick making**	None significant
Kiwembo-Kawaga	1.12	P	Papyrus harvesting, hunting	None significant
Kyetinda	1.43	P	**Cultivation**, papyrus harvesting	Conversion
Mayanja	0.7	S	**Cultivation**, settlements, vegetation harvesting, firewood collection	Conversion
Nakivubo	4.87	P	Effluent treatment, **cultivatio**n, papyrus harvesting, settlement, **brick making**	Conversion, over-harvesting
Lubigi	2.96	P	Harvesting papyrus/palms, **brick making**, sand extraction, **cultivation**	Conversion
Jugula	0.26	P	**Cultivation brick making**	Conversion
Nabisasiro	1.94	S	**Cultivation**, **brick making**, livestock farms, water collection, waste dumping	Conversion
Nalukolongo	0.91	P.S	Settlement, industrial development, **cultivation**	Conversion
Nsooba	1.24	S	Settlement, **cultivation**, waste disposal, **brick making**	Conversion (permanent pollution)
Bulyera	0.93	S	**Cultivation**, **brick making**, woodlots	Conversion, pollution
-	1.74	S	Settlements**, cultivation**	Conversion, pollution, silting
Kyabatola	0.06	S	Settlements**, cultivation**, **brick making**, pollution	Conversion
Wabusanke	0.03	S	Cultivation, **brick making**	Conversion
Kondi	0.21	S	**Cultivation**, fish farming	Conversion
Nakalere	0.13	S	Settlements, livestock farms, **cultivation**	Conversion
Nalubaga	0.74	S	Harvesting trees	None significant
Nyanjerade	0.91	S	**Cultivation**	Conversion
Walufumbe	1.33	S	**Cultivation**, livestock farms, grazing, water collection**, brick making**	Conversion
Kalungi	0.22	S	**Cultivation**, woodlots, **brick making**	Conversion

Source: Kampala District Wetlands (Ministry of Water Lands and Environment) November 2000
P – Permanent S - Seasonal