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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
FDI	Foreign Direct Investment
GIS	Geographic Information Systems
GPS	Global Positioning System
JET	Journalist Environmental Association of Tanzania
KCC	Kampala City Council
KDMP	Kampala Drainage Master Plan
LC	Local Council (LC1 – LC5)
LGDP	Local Government Development Programme
MOHUD	Ministry of Housing and Urban Development
MoFP & ED	Ministry of Finance Planning and Economic Development
MPED	Ministry of Planning and Economic Development
MUIENR	Makerere University Institute of Environment and Natural Resources
MWLE	Ministry of Water Lands and Environment
NEIC	National Environment Information Centre
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
UEPF	Uganda Environment Protection Forum
UBOS	Uganda Bureau of Statistics
UBS	Uganda Bureau of Standards
UIA	Uganda Investment Authority
UMA	Uganda Manufacturers Association
U/P/E	Urbanization Population and Environment
VECs	Valued Environmental Components
VCM	Vicious Circle Model

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 absorbed 40% of the national urban population and 4.9% of the national population by 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. However, this growth and expansion are associated with lack of infrastructure, social services and pose planning and environment problems. The challenge is how to address the problems through pro-active policy and concerted effort by the city authority, government 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 environment and 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.

1.0 INTRODUCTION

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. Population increase in Kampala metropolitan area is responsible for increased demand for employment, land for housing, social services and infrastructure that have stimulated a fast spatial urban development and industrialization. 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. 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/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; Walter V. 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

Human beings have changed the ecosystems and environment more rapidly and extensively in the 1990s than in any comparable period of time in history. Through 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, 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 examined 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. (Fig. 1.1).

Where as the schematic representations may imply a linear relationship between population dynamics and urban development, a two-way interaction exists continuously. It is also recognized that there are also other mediating 'external' factors, which are not a focus of the research. This conceptual framework offers a basis for an assessment of the linkages and derivation of policy recommendations for sustainable urban development in Uganda. Such an assessment is envisaged to make a significant contribution to knowledge about the effects of population dynamics and urban development to the environment.

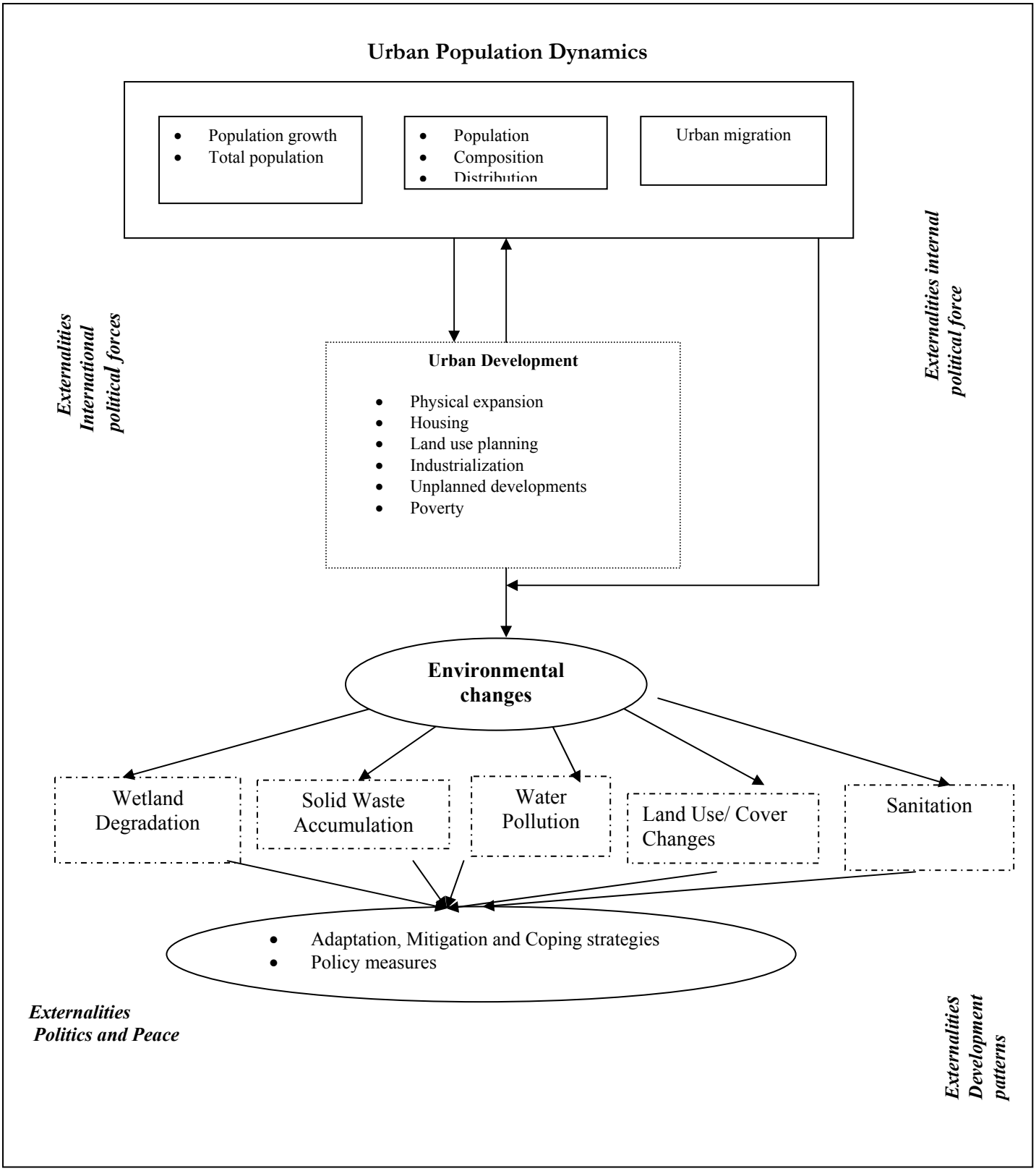


Fig. 1.1: Conceptual Model of the Study

1.3 Scientific objective

The general objective of the study was to analyze the relationships between population, urban development and environment to formulate pro-active 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
- 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 extent of wetland degradation through population growth and urban development

2.0 Research methodology

2.1 Introduction

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

2.2 Secondary sources

The project collected secondary data from government documents, academic research reports, consultancy and newspaper reports. This 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 informed stakeholders. Statistical and qualitative analytical tools were used in analyzing these data.

2.3 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). Additional knowledge of the area characteristics was captured through field reconnaissance surveys. Statistical data was also derived from the digitized maps of wetlands and classified land use maps of the imagery.

2.4 Focus Group Discussions (FGD) and workshops

Results of the study were enhanced with data collected through FGD workshops with stakeholders who provided vital inputs. Two neighborhoods that generally have the characteristics described in the conceptual model were selected for the FGD's. Through these meetings, data on environmental burdens, coping strategies, poverty was collected and utilized to validate information collected from other sources.

3.0 Research findings

Research findings reveal that Kampala's population is growing very fast (5.6% p.a.) while industrialization and economic development are slow. This has led to unemployment, which has stimulated the development of a disorganized informal sector. A combination of a rapidly growing population, a disorganized informal sector and unplanned developments have led to environmental degradation. The research findings are presented as per objective of section 1.3

3.1 Population Growth and Environment

Population dynamics is an important component for 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 in the conceptual framework, population dynamics are the underlying drivers of environmental change in Kampala.. The population of Kampala like that of other urban centers in the country has been increasing. This has mainly been due to high fertility, natural increase, decline in mortality, internal and international migrations (UBOS 1991; UBOS 2002). Kampala has continued to be a primate city as a hub of economic, social, commercial, industrial and political activities that attract both internal and external migrants (Table 3.1).

Table 3.1: 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

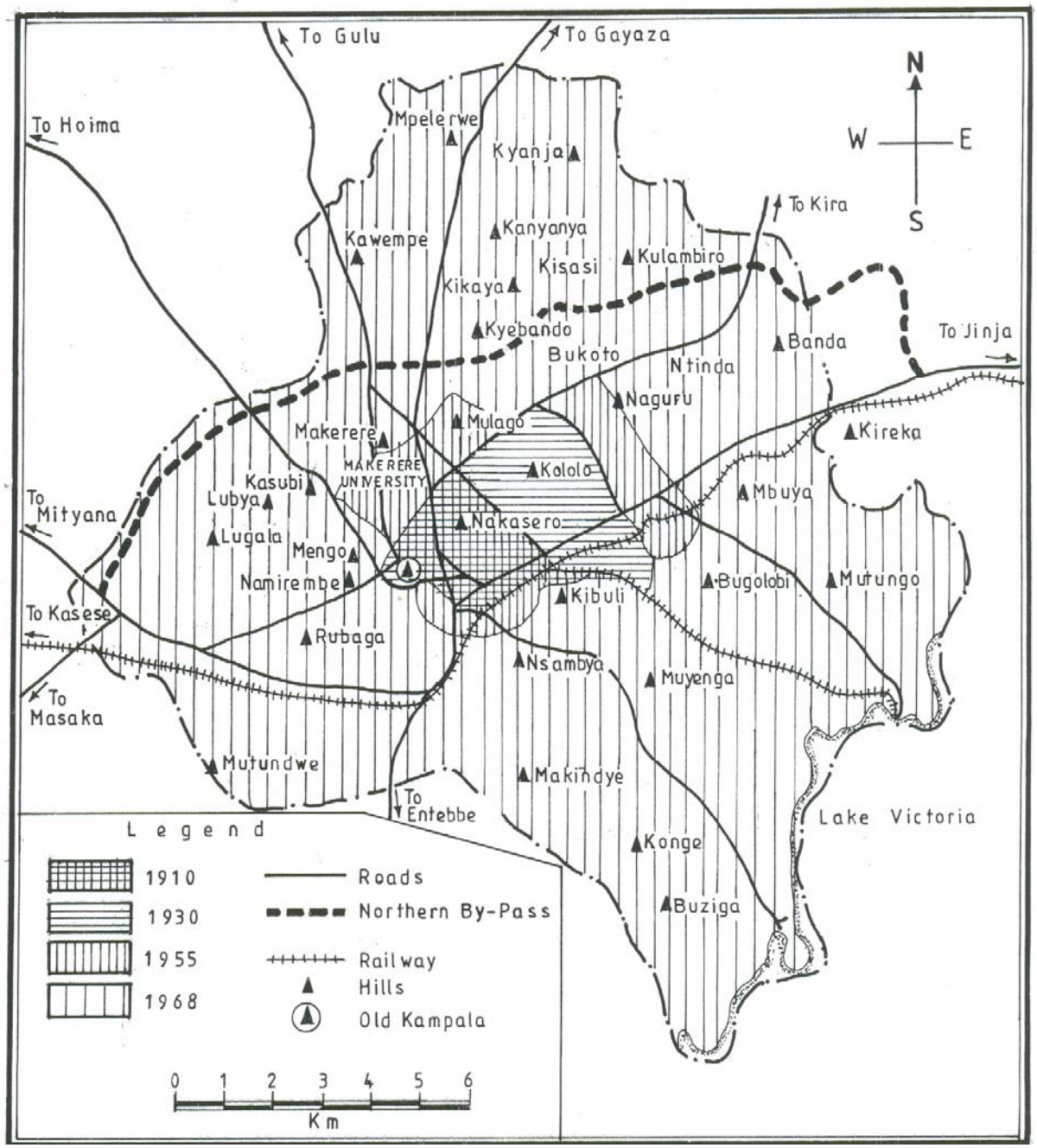
Rapid population growth experienced in Kampala has adversely affected economic development and poverty by depressing wages, reducing saving rates and degrading natural resources. Population distribution is not even among the five administrative units (divisions). This is mainly due to: - variation in level of economic development, availability of residential space, distance to the town center and distribution of social infrastructure. Population is dominated by children under 18 years (44.9%), a few above 60 years (1.7%) and there are more females (51.3%) than males (48.7%)

The rapid population growth experienced in Kampala is putting a lot of pressure on the environment. As the unlucky residents fail to get formal jobs and decent accommodation, they resort to the ever-expanding informal sector for employment and accommodation. The sector is increasingly degrading the environment through wetland degradation, solid waste accumulation, water contamination and poor sanitary conditions.

3.2 Physical expansion and planning evolution of Kampala

Kampala is the only urban district in Uganda. It is built on a series of hills with 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 covering an area of 0.68 sq. km. It was gazetted a town council in 1906 with an area of 8 sq km and was extended to cover an area of approximately 195 sq. km. in 1968. (Map 3.1). However, some of the urban population is now shifting to Kansagati, Nansana, Kyengera, Kira, Kajjansi , Wakiso, Maganjo and Kawanda which are in Wakiso district but satellite to Kampala (Map 3.2). The physical expansion of Kampala has been "guided" by different physical planning schemes. The first one was produced in 1912 and others were produced in 1919, 1930, 1972 and 1994 when a structural plan was made. Despite these planning schemes, developments in Kampala especially housing have continued to be haphazard, unplanned and located outside planned area. This is blamed on KCC's failure to implement/enforce the planning schemes, continued political interference, conflicting land use policies, uncoordinated instructions between KCC and Ministry of Local Government and at times State House.

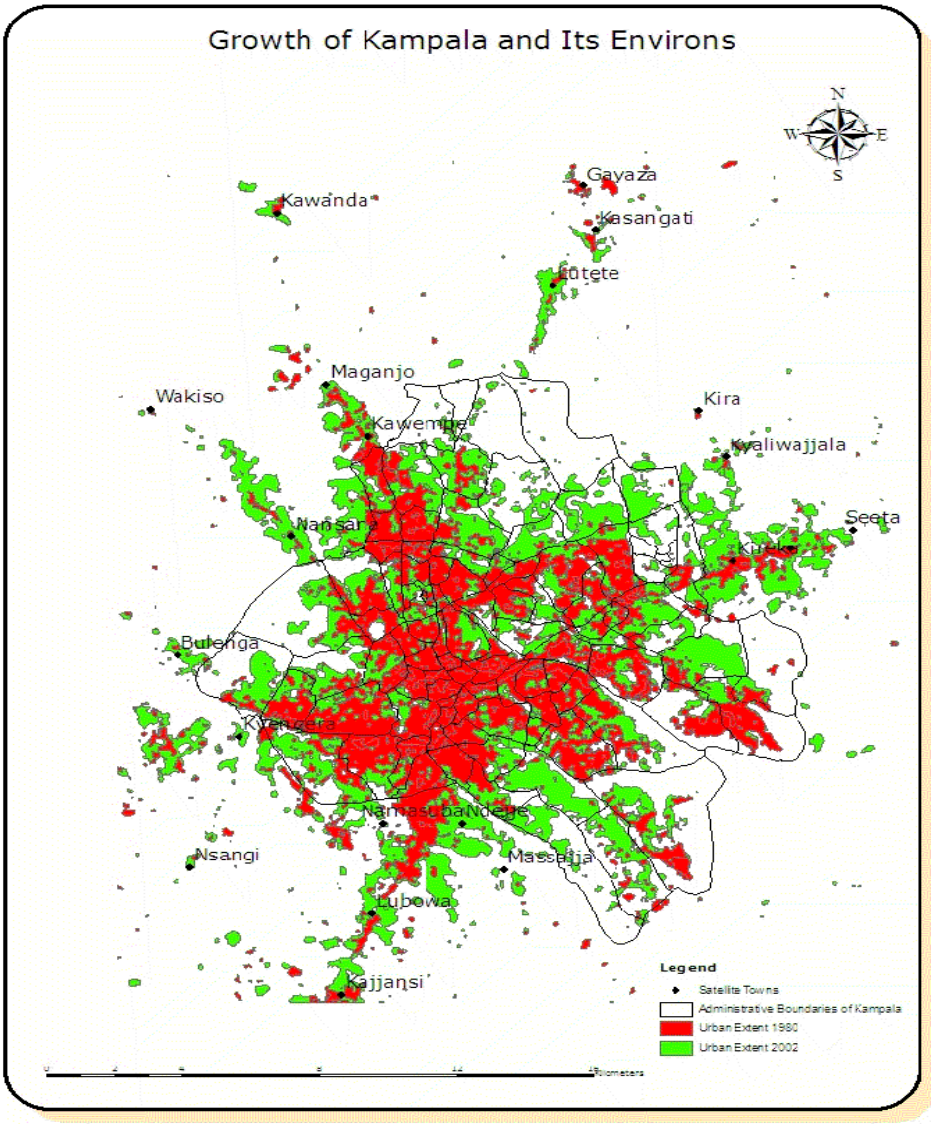
Map 3.1: Physical Expansion of Kampala



Source: Uganda Atlas 1998 and Kibirige (2006).

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 especially that of the urban poor which is characterized by appalling conditions of poor environmental health, dump houses, disease and flooding due to poor drainage (plates 3.1 & 3.2). The unplanned housing developments have greatly degraded wetlands and led to the development of slums and Kampala is at times referred to as "the rich man's slum".

Map 3.2 Growth of Kampala and its Environs 1980 – 2001



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

Plate 3.1: A flooded housing Estate constructed in a wetland

Plate 3.2: High class residential housing in a wetland under floods

3.3 Industrialization in Kampala

Industrialization has increased in Kampala largely due to the liberal investment policy and other macro-economic policies (MoFEP 1995; Byandala 1996; Lwasa 2004). Kampala and the environs have 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. 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 991, 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. Practically all Kampala's markets attract a range of informal artisanal industries, which are located either within, or around them.

Industries in Kampala range from small to large scale. The small scale industries are involved in metal fabrication wood works, wine and soft drinks making. The large scale industries are involved in textile manufacture, steel rolling mills tiles and brick making, soft drinks and beer bottling, hollow ware and tannery. These small-scale industries 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, which exceeds 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 influx of laborers. 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. 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 unemployed labour has been forced to join the rapidly expanding and disorganized informal sector. The labour influx has stimulated a rapidly growing housing sector which unfortunately unplanned and now a threat to the environment.

3.4 Water pollution and sanitation

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. Kampala has its raw water intake in Murchison Bay, where there is increasing pollution from the city. NWSC is spending more 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 waste water systems (NEMA 1997A). The problem of leakages is not primarily loss of water, but that loss in pressure may allow contamination to enter the pipes. It is relatively easy for sewage and household wastewater to enter the water distribution mains. The other water sources namely protected and unprotected springs, rain water are all polluted.

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. 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. The poor maintenance of the distribution system, sewer, storm water networks has created avenues for contamination in the supply network from the wide spread pit latrines and open disposal of human wastes in high density areas. Though the contamination may not be at alarming levels, the slow upgrading of the network may imply future high levels of contamination. Also contaminated from underground seepage of pit latrines are the alternative water sources including; streams, rivers, lakes, ponds and 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. The presence of *Escheleischa Coli* is an indication of faecal contamination (Byabakama 1998) in the many springs around the city and metro area. 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. The poor sanitary conditions in Kampala are manifested in the frequent outbreaks of cholera, water borne and related epidemics like dysentery, bloody diarrhea. People are in constant contact with pathogens especially in the poor neighborhoods.

3.4.1 Solid Waste Accumulation

Kampala like many other major cities in the developing countries is faced with rapid urbanization and along with the associated coping (survival) strategies are excessively straining the existing socio-economic facilities and under-investment in new ones. One of the environmental consequences of rapid urbanization that has been neglected in planning 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 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 3.2).

Table 3.2: 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.*

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 enjoyed the urban administration monopolistic statutory requirement of collection, storage and disposal of waste ((KCC 1995, Uganda 1964). With inadequate supply of skips and trucks, it has lead to accumulation and overflowing of garbage as well as emergence of illegal dumping sites (Plates 3.3 and 3.4). 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, this ushered in private involvement in collection and transportation of wastes to the landfill. 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 3.3: An overflowing City Council Skip in Wandegeya next to Makerere University 2004

Plate 3.4: Accumulated solid waste in a settled area: a result of irregular collection

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. Indiscriminate dumping is exacerbated by the absence of garbage sorting by type at generation points. This type of dumping 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). 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 along the road and unattended plots have emerged(Lwasa 1999; Lwasa 2004). 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. Associated to the problem of alternative duping sites by waste generators in the high collection fees levied by the private operators. In addition, high density settlements also pose a challenge of reaching to many households let lone tracking and following up payments.

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. However the communities have started addressing these problems through initiatives that uptake wastes for example some wastes in Kampala are converted into different resources such as metallic containers, children toys, 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.

3.5 Land use/cover changes and wetlands degradation

Increase in urban population, industrialization and the associated demand for housing have led to land use/land-cover changes. Predominated by agriculture 62.2%, 16% built up area and 1.7% industrial activity. Both built up and industrial uses/cover, area more than doubled in the period of (1980 – 2002) 22 years while agriculture declined by a quarter as it was converted to buildings and industrial use.

Table 3.3 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*

Similarly wetlands, which are mainly covered by papyrus, also reduced from 20.6% to 1.9% occupancy of the land area. Industrial, forest and built up land changed faster at 8.9% forest 11.4% and industrial at 15.7% p.a. respectively. This is because industrial establishment imply increased demand for labor and housing for the laborers.

Kampala's wetlands have been greatly degraded 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. 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). Housing, industrialization and infrastructure development play an important role in wetland degradation. 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. The high population density (approx. average of 3, 974 persons per $km^{2)}$ is one of the main causes of wetland degradation in the district. The driving factors of wetland degradation in Kampala have destroyed the Kinawataka wetland, between Nakawa, Ntinda and Kireka, and part of Nalukolongo, Nsooba, Bulyera, Kiyanja, Kansanga, Kyetinda, Mayanja and Nakivubo wetlands which form a lining around Kampala metro area.

The encroachment and degradation is further driven by factors including; Political interference in abuse of wetlands; Inadequate enforcement capacity amongst the various institutions charged with environmental management and city; 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.

4.0 Interaction between P/D/E

The interactions between population and urban development in Kampala have manifested positive and negative environmental 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.

The interactions have contributed to poverty and the urban poor in Kampala (43%) are much more disadvantaged than their rural counterparts since they live in poor conditions with persistent environmental burdens of flooding and accumulated wastes(KCC 2003). In terms of employment, the informal sector and self-employment are dominant and largely gendered. Incomes fluctuate a great deal between different periods of time, even between days. The spatial analysis of poverty, indicate that Kampala has several 'poverty hot spots' dotted around in the city's high density low-income settlements.

5.0 Coping strategies

The challenge of managing environmental burdens relies heavily at the household level to cope with accumulated wastes, water pollution, flooding and resolving the poor sanitation issues. 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 are in response to economic, housing and environmental challenges.

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 inconceivable. Most have joined the ever expanding informal sector production and trade either as self-employed or employees while many engage in odd illegal activities such as drug trafficking, robbery, pick-pocketing and prostitution for a living. Other coping strategies have taken advantage of the available resources and these include; urban agriculture, waste recycling and reuse. However, these activities have negative impacts associated with pollution, waste generation, sanitation and congestion.

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 sections 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. 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.

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 solid wastes and earth bags are also laid around the house to prevent floodwaters reaching the houses. 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.

The biggest challenge to the urban poor is solid waste management and poor sanitation as their residential areas are not served with garbage collection facilities by KCC. The residents have resorted to burning, disposal in drainage channels and feeding the vegetable materials to animals. However, these measures do not solve the problem but create more e.g flooding, water pollution and poor sanitary conditions. Those without toilet facilities use polythene bags and throw the contents in open spaces, drainage channels others especially children defecate in drainage channels and open spaces. All these worsen the sanitary conditions.

6.0 Policy Needs

Recognizing the current discourses on the concept of sustainability in various literature, sustainable development needs to be coupled with easing of urban poverty (Enyedi 2003; UNDP 2005). 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. 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.

Urban Governance

Urban governance as a policy consideration is an important sphere due to the growing social and environmental conflicts in urban systems. 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. To achieve sustainable governance urban communities need to be involved in the planning processes moving from technocratic to socio-cratic planning. Massive education and inclusion in decision-making is a requirement for sustainable urban development. In this context, grass-root mobilization is one such policy requirement for improved governance of the urban development process and environmental management(MoFPED 2000). 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. These policy initiatives should be undertaken by KCC and LC3 in collaboration with the relevant ministries.

Urban Social Policy

Urban social policy needs to coordinate social capital in making the society function efficiently and requires engaging civic activity through advocacy for the communities to claim 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. Ministry of Local Government through consultations with the communities, Local Councils, NGOs, CBOs, KCC, and religious institutions should design the urban social policy.

Planning Policy

Planning as an intervening factor in addressing environmental problems needs attention for sustainable urban development. Planning in Kampala has been in existence since the turn of the 20th Century, but its impact on urban development has not been adequately felt. This is due to 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. The second issue is the need for strategic planning for urban environmental management in metro area of Kampala. KCC should design an effective planning policy clearly spelling out who should do what and

where every activity should be located. The policy should have clear mechanisms for implementation and punishment of those who violate it.

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. Urban population challenges may slightly differ from rural population problems. The policy considerations therefore include; reduction of infant mortality, increased immunization, education, intensified fight against HIV/AIDS epidemic, comprehensive labor and employment policies, concomitant rural development and service provision to reduce migration into cities and gender mainstreaming to enhance the role and position of women, youth and elderly in development. KCC should coordinate the operations of those policy requirements with the relevant ministries. It should involve CBOs, NGOs, LC 1 – LC3 in implementation.

Solid waste management policy

Policy on solid waste management 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. However the KCC Solid wastes Ordinances which are under implementation is a starting step to proper management of wastes. The government through the Ministry of Local Government should draw up a well defined solid waste management policy. KCC solid waste ordinances need to be dynamic and all embracing where communities, CBOs, NGOs and private sector involved in solid waste management. User fee should be introduced and enforced.

Social infrastructure and public services policy

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 electricity system, the industrial and commercial businesses are using their own generators, which have significantly increased both their investments, running costs but more importantly pollution through CO_2 deposition. The government should design a policy to address social infrastructure and service provision including an efficient and effective management of human wastes, which pose challenges for the city authorities.

Urban land use and housing policies

Controlling urban land use and housing 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 for efficiency. KCC through the Ministry of Health should improve the housing and physical planning policies 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.

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. The industrialization policy, should take 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 such a policy. The Ministry of Tourism Trade and Industry should come up with an industrial policy, which address the above issues. KCC as an implement agent should ensure that developers adhere to the policy.

Integrated Urban Development 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. The major 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 for sustainable urban development. 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. KCC, should study all the policies pertaining to urban development, identify contradictions propose ways and means to harmonize them. It should then work with urban centers to design a National Integrated Urban development policy, which emphasizes sustainable Environmental Management.

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. 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. 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 addressed 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.

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