

**AN EXAMINATION OF THE IMPACTS OF THE 2005/2006 POLICY REVIEW ON
DENSIFICATION OF LOW DENSITY RESIDENTIAL ESTATES IN NAIROBI:**

A Case Study of Kileleshwa Estate

BY

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**A Thesis submitted in partial fulfilment of the requirements for the degree of the
Master of Arts in Planning**

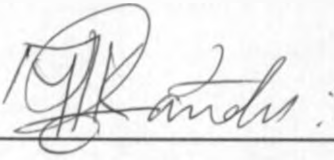
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DECLARATION

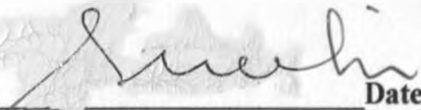
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This Thesis has been submitted for examination with my approval as University supervisor.

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DEDICATION

This thesis report is dedicated to my fiancée, Helen Jane Altshul.

ACKNOWLEDGEMENT

This research report would not have been possible without the contribution from the various individuals and organizations. I wish to thank Helen Jane Altshul for her unwavering support and her mum Judith Felicity Altshul for sponsoring this research project. I also appreciate the help and guidance accorded to me by my supervisor DR. Samuel Obiero of the Department of Urban and Regional Planning of the University of Nairobi. I cannot forget all the key informants from various Ministries, the City Council of Nairobi and other institutions for availing the materials used for this research and for availing themselves for the interviews. Lastly to my classmates Fawcett and Cletius, the teaching and non teaching staff of the Department of Urban and Regional Planning for the moral support and encouragement.

ABSTRACT

Densification of low density residential areas is practiced worldwide to counter the outward spread of cities and to offset the negative effects caused by this spread. Some of the negative effects include; air pollution due to increased use of the motor car, the loss of agricultural fertile land to urban uses, encroachment into environmental sensitive land leading to loss of biodiversity, contamination of water bodies and the increased costs of providing infrastructure to the scattered settlements.

But densification brings with it numerous challenges especially when the infrastructure is not upgraded commensurate with the increased population including; water shortages, blocked sewers, traffic congestion, invasion of road reserves and other available open spaces among others.

This study focused on a policy review conducted in 2005/2006 by the City Council of Nairobi and other stake holders to address the negative effects of densification on former low density residential estates. It aimed at examining the impacts of the policy review on the Kileleshwa estate; based on the examinations recommend strategic policy interventions towards a better Kileleshwa estate and to ensure that densification in future is done with adequate consideration given to the available infrastructure and the carrying capacity of other existing facilities.

The study findings indicate that the 2005/2006 policy review failed to alleviate the negative effects of densification in Kileleshwa estate. Challenges of water shortages, blocked sewer, traffic congestion, loss of privacy and setting up businesses outside the designated commercial centres among other challenges still exist in the estate. The policy intervention managed to create sub-planning zones from the former larger planning zones that could be used as an entry point to address various issues of development control.

The study recommends multi-sector partnerships in the upgrading of infrastructure to cater for an increasing population, formation of an efficient and affordable public transport system, a requirement as a pre-requisite condition for development approval for developers to include in their designs aspects of rain water harvesting. The study also recommends the exploration of the possibilities of setting up a National Sewer System, with budgetary allocations for the development of a national sewer network that municipalities would connect to as opposed to the present situation where every municipality has to develop its own sewer system.

ABBREVIATION AND ACRONYMS

CBD-Central Bureau of Statistics

CCN-City Council of Nairobi

NGO-Non Governmental Organization

NMGS- Nairobi Metropolitan Growth Strategy

NEMA-National Environmental Management Authority

EIA-Environmental Impact Assessment

NW&SC-Nairobi Water & Sewer Company

KUR-Kenya Uganda Railway

GDP-Gross Domestic Products

DRSRS-Department of Resource Survey and Remote Sensing

ICT-Information Communication Technology

EEC-European Economic Commission

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CHAPTER ONE-INTRODUCTION

1.0 BACKGROUND TO THE PROBLEM

The world is changing more rapidly now than at any time in human history, and two trends are primarily responsible for the transformation; *population growth* and *urbanisation*. In 2000, world population reached 6.1 billion, and is growing at an annual rate of 1.2 per cent, or 77 million people per year (URBAN MILLENIUM, 2001). It is projected that in the next two decades, another 1.7 billion people will be added to the world's population and the world's population will reach 7.0 billion people by the year 2010 (Jones,1990, UNEP,1992).

In Africa growth rates have increased at approximately 3 per cent per year over the last two decades. Moreover, urban population growth is expected to continue in Africa and it is estimated that by the year 2025 approximately 42.5 per cent of Africa's population will live in cities (UNCHS/ILO, 1995). Growth will be more rapid in the urban areas of less developed regions, the population in these urban areas will grow from 1.9 billion to 3.9 billion in 2030, Asia and Africa will have higher numbers of urban dwellers than any other major area of the world (URBAN MILLENIUM, 2001).

Since the 16th century all the economic activities have taken place within the city (Mumford, 1961), but the development of new technologies during the industrial revolution enabled cities to build new urban forms, characterized by sub-centres and an expansion out of the walls. This push driven by the introduction of trains and trams allowed cities to spread outwards (Newman, 1992). The Compact City Model offers a solution to the rapid outward development of cities based on the followings qualities; high-density development, less car dependency, improvement of the public transportation, support for walking and cycling, mixed-use development, better access to services and facilities, preservation of green areas, conservation of the countryside, regeneration of inner urban areas and efficient use of infrastructure (Breheny, 1995).

Kenya's urban centres have been growing rapidly and are expected to continue growing at the annual rate of 3.9 per cent for the period 2005-2010 despite inadequate capacity combined with difficult economic circumstances that have hindered the design of solutions to challenges brought about by rapid urbanisation. Urban areas have grown haphazardly without physical development plans which have caused economic inefficiency, environmental degradation and led to poor living conditions. Only 30 per cent of Kenya's urban towns are planned, as a result,

Kenyan towns have been grappling with unplanned settlements, traffic congestion, pollution, inefficient and costly public transport systems, constraints in provision of water, sanitation, security and housing (Republic of Kenya: MTP 2008 – 2012).

Nairobi has had a master plan in 1948 and a structure plan in 1973 for urban development. The master plan was conceived as a key plan to the general physical, economic and social development of Nairobi for a period of 25 years (Thornton White L.W. et al, 1948), thus it expired in 1973. The structure plan was a comprehensive proposal for the use of land, highways and public transport, the city's central area, housing programmes and employment creation to fit together in a logical whole. The structure plan was prepared for a city of 3 million people and expired it expired in 2003 (Nairobi Urban Study Group, 1973). The two plans together have had a great influence on the shape of the city and are accredited for the spatial distribution of various land uses in the city.

The most recent plan “The Nairobi Metro 2030” is a strategic plan prepared for the Nairobi metropolis which stipulates that the metropolis will be built upon 7 building blocks, these are; an internationally competitive and inclusive economy, world class infrastructure and utilities, optimising mobility and accessibility, enhancing the quality of life and inclusiveness, making the metropolitan region the place of choice, ensuring a safe and secure Nairobi metropolitan region, a robust and comprehensive implementation framework focusing on: planning and allocation of resources, metropolitan governance, management of strategic change, indicators and measuring progress (Nairobi Metro 2030).

Owing to the high rate of urbanisation against a backdrop of limited urban land, it has become necessary for the City Council of Nairobi (CCN) to review planning and development standards in areas previously zoned for low density development with a view to densification in order to accommodate more activities and population. In the 1990s zones 3, 4 and 5 were densified as occasioned by the 1993/1996 development policy leading to maximization of land use as opposed to the earlier residential maisonettes and bungalows sitting on half acre plots that were replaced with high rise apartments and mixed development typology. (Zone 3- Parklands, City Park Estate, Westlands Central Business District Area and the Museum Hill area; Zone 4- Lower Spring Valley, Riverside Drive, Kileleshwa, Kilimani, Thompson and Woodley/Ngong Road; Zone 5- Upper Spring Valley, Kyuna, Loresho and Lavington/Bernard Estate). This envisaged

creating opportunities for new investments, employment, additional housing while conserving prime neighbourhoods, improved infrastructure and healthy environments. The policy recommendations that were later adopted are exemplified in table 1-1 below.

Table 1-1: Development policy guidelines from 1993/1996 policy review

Zone	Areas Covered	Ground Coverage %	Plot Ratio %	Type of Development Allowed	Min Area (Ha)	Remarks / Policy Issues
3	Parklands	50	100	Commercial / Residential (High-rise Flats)	0.05	Policy under Review
	· Commercial	35	75			
	· Residential					
	City Park Estate/Upper Parklands	35	75			
3	Westlands	80	200	Commercial/ Offices/ Residential (High-rise Flats) Four Storey max.	0.05	Policy Under Review
	· Westlands CBD	35	80			
	· Westlands/Museum Hill	80	200			
	· Block 1 Commercial					
	· Block 2 & 3 offices, high-rise Residential.					
· Block 4 offices						
· Block-5 Commercial/Residential						
4	Spring Valley	35 (s)	75 (s)	Residential (Apartments allowed on sewer only) - 4 storeys max.	0.05	Policy Under Review
	Riverside Drive	25 (u)	25 (u)			
	Kileleshwa					
	Kilimani					
	Thompson					
	Woodley					
5	Upper Spring Valley	25	25	Low density Residential One Family House	0.2	Maisonettes allowed on sewered areas of Lavington.
	Kyuna	35	75			
	Loresho	25	25			
	Lavington/Bernard Estate					
	· On Sewer (s)					
	· Unsewered (u)					

Source: City Council of Nairobi, 2004

However, with sustained economic recovery and progressive growth in the beginning of the year 2000, the zones experienced increased development more than ever before, development outpaced forward planning intervention. The developments were mainly driven by the demand

for housing, commercial and office developments. This was met by a public outcry from the residents who voiced various concerns that the developments were being carried out without a commensurate upgrading of the existing level of infrastructure to support the housing, commercial and office developments. This brought about unprecedented negative social and environmental impacts which were classified into the following broad categories:

- i) Inadequate infrastructure development (water, sewer, roads and drainage)
- ii) Traffic congestion
- iii) Over densification of housing developments
- iv) Incongruous developments
- v) Rising land values
- vi) Environmental degradation
- vii) Lack of adherence to development control measures

In view of the negative social and environmental impacts highlighted above, another policy review for Zones 3, 4 and 5 was undertaken in 2005/2006 with the aim of addressing the challenges brought about by densification. The outcome of this policy review was a new development policy framework that was adapted in 2007 as shown in table 1-2 below.

Table 1-2: Development policy guidelines from the 2005/2006 policy review

Zone	Sub Zone/ covered Area	Ground Coverage %	Plot Ratio %	Min Area (Ha)	Type of Development	Remarks/ Policy issues
3	Parklands, Highridge Centre	2.0	0.2	0.2	Mixed Use- commercial and residential	Mixed development, Roads widening and harmonisation of road widths
	1st Parklands Avenue, Parklands Road and Shivachi Road	1.0	0.2	0.2	Flat development	Maximum four floors
	Remaining Part of Parklands	1.5	0.2	0.2	Flat development	Maximum two flows
	Deep Sea	-	16.8	16.8	Open Space/ Recreational	Area to be reclaimed from informal to public open space

4	4A-Upper Parklands, Mathari River, Canalized stream,	35 25 20	0.75 0.25 0.20	0.1 (S) 0.2 (US)* 0.25 (US)**	No flats Maisonettes and Town houses allowed on minimum 0.05ha per household	No development of flats and apartments
	4B1-Waiyaki way, Nairobi river, Mvuli road	35	1.5	0.1	Office and residential Development	Mixed use development: residential and office allowed
	4B2-Mvuli road, Nairobi river, Mahiga Mairu, canalized stream, Ring road, Lower Kabete road, Karuna road	35	1.0	0.2 0.05	Flats Single dwelling maisonettes or town houses on 0.05 ha	-
4	4B3-Waiyaki way corridor				Office development	Conform to existing policy guidelines Maximum 4 floors
	4C-Riverside Nairobi river, Kirichwa Ndogo, Ring road Kileleshwa, and boundary of zone 4 & zone 5	35	0.75	0.4 0.05	No Flats Single dwelling maisonettes or town houses on 0.05 ha	Conform to existing policy guidelines
	4D-Kileleshwa area: Kirichwa Ndogo, Kirichwa Kubwa, Muthangari road	35	1.0	0.4 0.05	Flats Single dwelling maisonettes or town houses on 0.05 ha	Regularize the existing flats; allow 10% for greenery; expand Kasuku Centre (to cover area within Migori Road, Laikipia Road and the Ring Road)

	4E-Yaya centre-Lenana Road, Wood Avenue, Chania road, and Chaka Road	35	1.5		Commercial Development	Harmonize the width of Argwings Kodhek road from Hurlingham to Ole Odume road to 24 metres and others within the commercial area to minimum 15 metres
	4F-Denis Pritt road, Lenana road, Rose Avenue, and Ralph Bunche road	35	0.75	0.05	Single dwelling maisonettes or town houses on 0.05 ha Flats	No Flat development Maximum 4 floors for flats on at least 0.4ha
	4G-Kirichwa Kubwa river, Gitanga road, Naivasha road, Ngong road, Valley road, Lenana road, and Rose avenue	35	1.0	0.2	Residential Flats	Flat development, Widening of Lenana road to 18 metres
	4H-Woodley Area – Ngong road, Impala club, Kibera station, Moi Girls School, Kabarnet road, and Mbagathi Way, and Golf Course edge	35	1.5	0.2	Maisonettes and town houses Mixed use: Residential and office development along Ngong road corridor	Densification of Woodley estate by the City Council; Shopping complexes (Nakumatt, Uchumi, etc.) to develop service lanes and bus stops on both sides of the road
	4I-Kabarnet Gardens – Kabarnet road, Golf Course edge,	35	0.75	0.2	Residential	Maintain existing character
5	5A-Upper Spring Valley, Loresho Estate	25	0.25	0.2	Residential	No development of flats and apartments Retain existing character Upgrade Loresho estate commercial node at

						junction of Loresho Ridge and Kaptagat road. Provide for Kibagare Park as a public open space Offices, bars and restaurants not permitted outside the designated commercial node
5B-Muthangan, Kianda, Bernard Estate, and Lavington	35	0.75	0.1 (S) 0.2 (US)	Residential single Dwelling		No development of flats and apartments Offices, bars and restaurants and residential hotels not permitted outside the designated commercial node Expansion of Lavington Green shopping centre as a designated commercial node Widen Gitanga road to 18 metres throughout
5C-Kianda triangle- Manyani road, Waiyaki way, and Hinga road	35	1.0	0.2	Residential		Allow flat development maximum four floors

Source: City Council of Nairobi, 2004

These new development policy guidelines that were meant to correct the negative social and environmental impacts of densification appear not to be contributing much towards achieving these objectives.

1.1 STATEMENT OF THE PROBLEM

The planning zones 3, 4 and 5 are experiencing challenges ranging from over densification of building developments which are not adequately supported by infrastructure and services, to the emergence of ribbon developments along primary and secondary streets leading to proliferation of business centres and informal economic activities beyond areas designated as commercial zones.

The incompatibility of mixed-use developments within homogenous residential neighbourhoods results in loss of privacy, increased over densification, flouting of the zoning policy and building development control regulations. This is in addition to urban environmental degradation characterized by loss of vegetation cover, open spaces, increased surface water run-off and the encroachment on riparian reserves.

The road bearing capacity has been exceeded in most areas, poor design of junctions, inadequate provision of bus stops, inadequate parking, inadequate provision of non-motorized transport infrastructure, the capacity for current levels of sewer and water has also been exceeded leading to pressure during peak periods. These problems have persisted despite the implementation of the revised development policy in 2006/2007 that was meant to curb the challenges. This study therefore seeks to examine the impacts of the 2005/2006 policy review on the densification of low density residential areas, specifically the Kileleshwa estate area.

1.2 RESEARCH QUESTIONS

- i. What factors led to the 2005/2006 policy review?
- ii. What are the impacts of the policy review on infrastructure, service provision, socioeconomic and environmental aspects?
- iii. What was the effectiveness of the policy review?
- iv. What is the relationship between theory and practice of development control?
- v. What policy options can be explored to remedy such situations?

1.3 RESEARCH OBJECTIVES

- i. Determine the factors which led to the policy review.
- ii. Examine the impacts of the policy review on infrastructure, services, socio-economic and environmental conditions.
- iii. Examine the relationship between the development control policies and development control practices.

- iv. **Make policy recommendations for the formulation and implementation of appropriate zone policy guide plans for the area.**

1.4 ASSUMPTIONS

The following assumptions were made with regards to this study:

- **The increased demand for housing units will increase the densification of developments in low density residential areas leading to serious social and economic problems including; increased congestion, unemployment, environmental degradation, high crime rates, poor infrastructure services, and proliferation of informal settlements with extremely poor living standards.**
- **The reviewed development policy has had a positive impact on the development in zones 3, 4 and 5 of Nairobi.**
- **Over-densification has been counter-productive in the development of commercial centres with economic benefits.**

1.5 JUSTIFICATION OF THE STUDY

The study is justified as there is no study that has been carried out in the Kileleshwa estate area to examine the impacts of the 2005/2006 policy review on the area and therefore the research aims at filling a knowledge gap. It is also expected that densification of low density residential estates will continue as it offers the best solution to urban sprawl and containment of cities within their boundaries, but in the cases where the infrastructure facilities are insufficient the possibility of negative effects due to densification are likely to occur. To avoid such undesirable negative effects it is important to have clear guidelines on how such processes should be carried out.

1.6 METHODOLOGY

1.6.1 Sampling Frame

Table 1-3: Sampling frame

Institution	Respondent
City Council of Nairobi	Departments of Forward Planning, Department of Development Control, Engineering Department
Ministry of Lands	Department of Physical Planning
Ministry of Housing	Public Relations
Nairobi Water & Sewerage Company	Zone 4 Regional Office
Residents of Kileleshwa	Residents, Business Community
Resident Association	Two Resident Associations
Developer	Two Developers
Institutions	A Primary School, Two Nursery Schools, Police station, Provincial Administration.

Source: Field survey 2010

1.6.2 The study process

The study involved four stages: The first stage involved reviewing relevant literature related to the study area; the second stage was the reconnaissance where the study area was visited in order for the researcher to familiarise himself various aspects of the area which were under investigation and to formulate the field work strategy. The third stage involved the field work where questionnaires were administered and interviews with key informants conducted. The fourth stage involved data analysis, interpretation, coming up with the policy intervention and writing of the research report.

1.6.3 Methods of data collection

Data was collected using questionnaires and observation checklists to gather information from the residents of Kileleshwa estate. Interview guides were used on key informants from the City Council of Nairobi, Ministry of Lands (Departments of Physical planning), Ministry of Housing, Nairobi Water & Sewerage Company, and institutions in Kileleshwa (Schools, Police, Provincial

administration, Developers). Photographs were used to capture the extent of the form and shape of residential properties and the densification phenomenon in the study area.

1.6.4 Data collection procedures

i) Primary data collection

- In-depth interviews-Department of Physical Planning, Ministry of Housing, Department of Forward Planning, Development Control, City Engineers, Developers, Institutions (Primary School, Nursery School, Police Station, Provincial Administration).
- Field observations-Transport patterns, solid and liquid wastes disposal and general trends of housing developments.
- Questionnaires-Residents of Kileleshwa.
- Photographs- The study area to capture the various aspects brought about by densification.

ii) Secondary data collection

- Government of Kenya Reports-Library, government printers, governments websites
- Legislation-Library, government printers, government websites.
- Official Policy Documents-Library, government printers, government websites.
- Previous Research Work-Library, Key informants

1.6.5 Sample Size

During the field work 30 questionnaires were administered to formal and informal businesses, 30 questionnaires were administered to the households. Interviews were conducted for key informants from; the City Council of Nairobi, Ministry of Lands, Ministry of Housing, Nairobi Water & Sewerage Company, a Developer and Institutions such as a Primary School, a Nursery School, a Kindergarten, the Police and the Provincial Administration. A total of 10 interviews were undertaken with key informants. The sample size represents a cross section of the various residents within Kileleshwa estate but and does not necessarily represent a sample of the population arrived at from the current population density of the area because at the time of carrying out this study such information was not available but the findings do represent the true character of the study area.

Table 1-4: Distribution of questionnaires and interview guides

Category	Number	Non Respondents
Questionnaires	55	5
Interview guides	10	0
Total	65	5

Source: Field survey 2010

1.6.6 Sampling Method

The key informants from the City Council of Nairobi, institutions in the study area and government Ministries as indicated in the sampling frame on Table 1-3 above were purposively selected, the key informants were selected on the perceived information that they would provide about the 2005/2006 policy review. Households and businesses were selected through a combination of the clustered sampling and random sampling methods. The various housing estates within Kileleshwa estate represented the clusters and questionnaires were administered in the various clusters by simple random sampling to select the first household in each cluster. The consequent households were selected using the systematic sampling method.

1.6.7 Data Analysis

The study generated both quantitative and qualitative data. The quantitative data was coded and analysed using SPSS, and presented in the form of charts, graphs and tables. Appropriate inferences, generalisations and conclusions were later made from the outcome.

The qualitative data was organised into themes and categories that were analysed and later explained in narrative form.

1.6.8 The study area

The Kileleshwa area selected for the study includes the area demarcated by the two rivers Kirichwa Kubwa and Kirichwa Ndogo up to where the two rivers converge in Arboretum. Specifically the area to the left of Ring road Kileleshwa, Manderu road, Gatundu road, Nyeri road and Othaya road; as one travels towards Gitanga road from the Arboretum. Within the Kileleshwa estate specific sites were selected where the questionnaires were administered depending on the level of densification that each specific area of Kileleshwa was experiencing. It is worth mentioning at this point that different areas of the Kileleshwa estate are experiencing

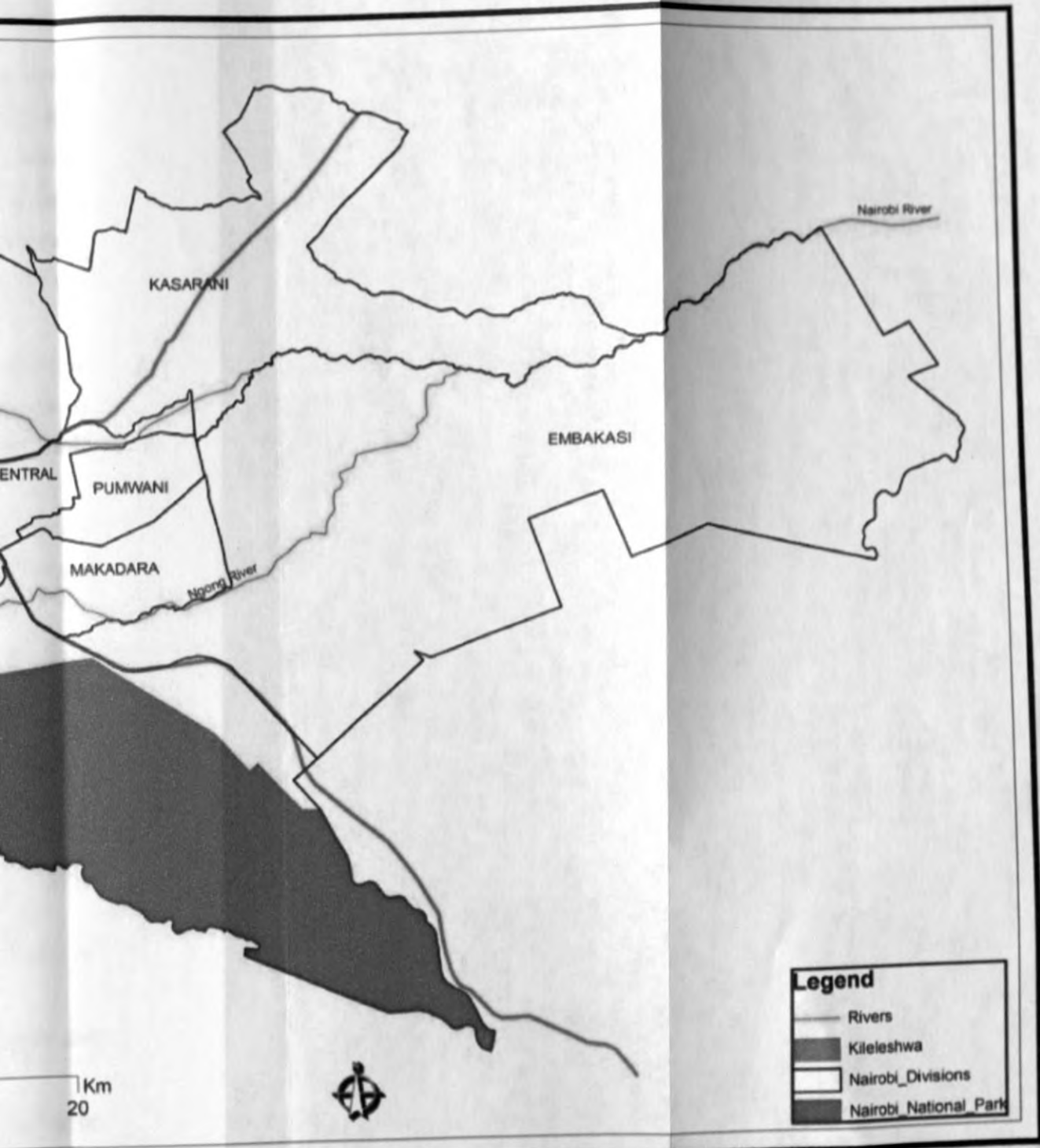
different levels of densification with some areas being more densified than others. Map 1-1 below shows the location of Kileleshwa within Nairobi.



Map 1-1: Kileleshwa



Source: Adapted from



KASARANI

Nairobi River

EMBAKASI

CENTRAL

PUMWANI

MAKADARA

Ngong River

Legend

- Rivers
- Kileleshwa
- Nairobi Divisions
- Nairobi National Park

1 Km
20



1.7 LIMITATIONS

The following are some of the limitations encountered and how they were dealt with:

- a) **Time:** The whole study process from research proposal, data collection to the submission of the final report took place within a very short period; this was overcome by dedicating more hours per day to the research thus it was completed within the required time frame.
- b) **Finances:** The research required research assistants to help in administering questionnaires, the unavailability of funds influenced the number of research assistants hired thus influencing of the number of questionnaires that were administered. This was dealt with by approaching well-wishers to help finance the study.
- c) **Unwillingness to provide information:** Unwillingness of the interviewees to release the information or answer some of the questionnaires about the study; this was overcome by getting the same information from previous related studies that were done in the same area.
- d) **Accessibility:** The study area being a gated community made it difficult to administer the household questionnaires; this was overcome by administering questionnaires at formal and informal commercial centres within the study area to the residents.
- e) **Loss of laptop:** A laptop containing all the information about the study was stolen three weeks before the submission deadline which destabilised the researcher; however this was overcome by working from a back-up that had been saved a month earlier from the date of the loss of the laptop.

1.8 DEFINITION OF KEY CONCEPTS

Building-Any structure or erection and any part of any structure or erection of any kind whatsoever whether permanent temporary, movable and whether completed or uncompleted.

Density-Means the maximum amount of development permitted or the maximum number of persons permitted to reside, as the case may be, on any area of land.

Densification-The process where-by residential densities are increased in a planned and meaningful way within existing boundaries of a specific area.

Development means-The making of any material change in the use or density of any building or land or the sub-division of any land which for the purpose of development.

Development application-An application made under for permission to develop land;

Development permission-Development permission granted under by a local authority to an applicant to develop land;

Land-Includes any land covered with water, and any building or other things attached to land, and any interest or right of easement in, to or over land;

Local physical development plan-A plan for the area or part thereof a city, municipal, town or urban council and includes a plan with reference to any trading or marketing centre;

Private land- Leasehold or freehold as defined in the Government lands Act, or Registered lands Act;

Road-Any road whether public or private and includes any street, square, court, alley, bridge, footway, path, passages or highway whether a thoroughfare or not;

Short-term plan-A local physical development plan which elaborates in detail policies and proposals in relation to precise areas of land and which provides the basis for both positive and regulatory planning to be realized within a specified period of time not exceeding ten years.

Sub division-In relation to land means the division of any land, other than buildings held under single ownership, into two or more parts whether the sub-division is by conveyance, transfer or partition or for the purpose of sale, gift lease or any other purpose;

Urban sprawl- Physical pattern of low-density expansion of large urban areas, under market conditions, mainly into the surrounding agricultural areas; usually characterized by unplanned, uncontrolled developments at the edge of a city.

Compact City- A relatively high-density, mixed-use city, based on an efficient public transport system and dimensions that encourage walking and cycling.

Urban intensification-Relates to the range of processes which make an area more compact.

1.9 STRUCTURE OF THE REPORT

The report is structured into seven chapters; chapter one is the introduction, chapter two is the literature review, chapter three are the dynamics of the city of Nairobi, chapter four is the study area: Kileleshwa, chapter five are the emerging issues from the 2005/2006 policy review, chapter six are the perceptions from the Kileleshwa estate residents, chapter seven is the summary of findings, recommendations and conclusion. To complete the report are the references.

CHAPTER TWO-LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 INTRODUCTION

The need for well planned functional urban residential estates is a desired goal for many rapidly growing cities in developing countries where the capacity to control development and to provide adequate infrastructure by city authorities is often lacking. Although most of the cities have plans that are supposed to direct their development these plans are rarely fully implemented. The consequences are dysfunctional cities characterized by problems ranging from deteriorating infrastructure, traffic congestion to environmental degradation.

It's not the absence of relevant legislation, policies, institutions or theories on how urban challenges can be addressed but a case of ineffective enforcement of development control measures to guide the development of cities in the developing world. This chapter puts within the Kenyan context the urban challenges, earlier and current planning attempts, available legislation and available alternatives to urban challenges.

2.1 THE DEVELOPMENT OF THE URBAN SPRAWL

Since the sixteenth century all the economic activities have taken place within the city, and the change from handcrafts to large scale factory production transformed the cities into huge machine of production (Mumford, 1961). The development of new technologies during the industrial revolution enabled cities to build up a new urban form, characterized by sub-centres and an expansion out of the walls. This push outwards was driven by the introduction of trains and trams, which allowed cities to spread up to twenty or thirty kilometres outwards (Newman, 1992).

With the introduction of the car, people were not obliged to live in the city or close to a transit station, but they are able to escape pollution and noise by living outside the city, using the automobile to reach their place of employment every day. The direct consequence was the development of low-density suburban sprawl and the decentralisation of cities. The main driving forces that have caused the decentralisation of cities are the following:

- Progress of transport, with regards the expansion of cars utilisation;
- Economic priorities, which enable the green fields growth to give space to the new suburban infrastructure;
- Cultural traits, concerning the new trends of life styles in our society.

The consequences that urban sprawl has brought to the society regards several concerns about the environment, the social life and the economic dimension. The impacts on the environment and on the ecosystems are substantial, and the activities associated with the sprawl degrades the natural resources such as surface water and ground water, wild habitats, air quality, landscape aesthetics and it influences the local climate conditions through the development of land.

The increase in the use of the car affects the quality of the air we breathe every day, the pollution of the environment has dramatically increased, threatening the health of the citizens and the quality of life for the future generations. The loss of community values and less leisure time, due to the longer commuting times are also pointed as unfavourable assessments of sprawl's social impacts.

The distance between sprawled areas implicates more investments in infrastructure; water, energy, wastes removal, the necessity to build more roads and to implement efficient public transport systems (Madureira et al, 2006). Urban sprawl is damaging the quality of life of many cities, although many factors damaging the environment are also related to other forms of urban development and social phenomenon.

2.2 THE COMPACT CITY MODEL

The Compact City Model was one of the solutions to the problem of the rapid outward development of the cities. The model of a dense and charming core of historic European cities, seen by architects, planners and tourists as the perfect place to live and experience the vivacity of urban life, represents the image of the compact city from outside.

The characteristics of the Compact City Model are mainly based on the followings qualities:

- High-density development;
- Less car dependency;
- Improvement of the public transportation services and support for walking and cycling;
- Mixed-use development and better access to services and facilities;
- Preservation of green areas and the conservation of the countryside;
- Regeneration of inner urban areas;
- Efficient use of infrastructure.

All of these aspects are considered the best efficient urban strategy from a sustainable planning development perspective for the social, economic and environmental dimensions, and they have to interact with each other to increase the density from current levels. In recent years there has

been a significant consensus that planning to get a more dense urban form is the most proficient way to reduce energy consumption and pollution (Breheny, 1995).

The supporters of this theory believe that urban densification, beside environmental and energy advantages brings also economic and social benefits; although the main concern nowadays regards the problem of global warming and the climate changes, which can be attenuated by the development of dense urban forms. To achieve sustainable environmental goals and a better health for the citizens, the Compact City Model promotes a less car dependency and the improvement of the public transports. The development of strategic policies to reduce the travel journey by car aims at decreasing air pollution and carbon dioxide emissions per capita, and the high-density form aims to increase the efficiency of public transports and to lessen the road infrastructure to save the waste of land. The modal shift from the private car to the public transport is much more efficient concerning the emissions of harmful gases and the increase of pollution. In fact, most of the collective transports are powered by electricity, and when this is produced by solar, wind or bio fuel energy, the reduction of emissions is significant (Nijamp et al, 1996).

2.3 ORIGINS OF DEVELOPMENT CONTROL IN BRITAIN

According to Thomas, 1997; Development control as currently practiced is highly dependent on statutory powers, a key starting point is the Town and Country Planning Act 1990 and the Planning Compensation Act 1991 and subsidiary legislation, especially the General Permitted Development Order 1995 and the Classes Order 1987. Thomas further elaborates that development control is a very wide-ranging subject and can embrace all human endeavours as far as it is expressed in the use of land:

- a) Substance and procedure - Development control is concerned with the real substance of development e.g. colour of a building or the width of a road. It is also concerned with a rational and legal procedure by which decisions are made.
- b) Scale - Development control operates at a widely different scale. At a humble level it may be concerned with the type of building or tiles used in a building. At the other end it could deal with an international airport extension, the customary scales of operation are; site level, local or district level, strategic or country or regional level, national level and international levels.

- c) **Professional disciplines** - It is in the nature of the building industry that many professionals are involved, all with their own perspective. They include architects, surveyors, civil engineers, financial experts, lawyers and others, including politicians and administrators. The role of the planning profession is to ensure that what is built fits into the environment in an orderly way.
- d) **Activities in adopted space** – Planners are concerned with four basic types of human activities, the building and spaces that accommodate them: Workspace, such as factories and schools, residential buildings, such as houses and residential institutions and leisure facilities such as playing fields and theatres. Transport in the fourth activity, which physically connects the other three.

Development control is not only concerned with new buildings but also with new activities in old buildings, consider the parking implications of changing a house to an office. Moreover, these activities interact; substantial new housing leads to an increased demand for new shops, schools and road space.

2.4 PURPOSES OF DEVELOPMENT CONTROL

Thomas, op cit., argues that the highest level of generalization the purpose of development control system is to ensure efficient and effective land use in the public interest. As far as it is possible to separate them, we can divide the general purpose into “people” and “property purposes”.

2.4.1 People purposes

A prime people purpose is to satisfy the social and economic aspirations of the citizenry as far as they are expressed through land use. Thus, the decision-makers in development control normally react positively to proposals to develop, however there may be good planning reasons why development should be refused. As people-owners, occupiers and users have varied aims and objectives, their use of land and buildings may involve conflict between them. A major purpose of development control is to resolve conflict.

2.4.2 Property purpose

A prime purpose is the coordination of investment in land and buildings. Land and buildings are in much ownership, but each plot and activity forms part of a working system, in a working whole. In making development control decisions, the planning authorities have to ensure as far as possible that development in one part of the system are not grossly out of synchronization with others. It is particularly important that road and sewerage infrastructure is of adequate capacity and that public open spaces are of adequate standards to cater for new developments.

The people-property purposes of development control and the methods of implementation are close and interactive. Thus, one of the purposes of the development control system is to facilitate decision-making by a clear process. Creating planning permission with conditions may positively enhance the environment and it promotes development. Refusal of planning permission and enforcement action prevents development which would harm it, development control helps fulfil the vision provided by development plans.

2.5 THE DEVELOPMENT PROCESS AND DEVELOPMENT CONTROL

Thomas op cit., further explains the development process as concerned with the stages by which buildings are built i.e.

- Initiation
- Building
- Disposal

The initiation stage crucially involves the investigation of the planning status of the proposal. If planning permission cannot be obtained, then the project will be aborted. The proposal may be permitted development, in which case planning permission may not be necessary. If planning permission is necessary, then there is a likelihood of getting it gauged by informal exploratory discussions with local planning authority.

The building stage may be a simple house extension in which case planning conditions are not likely to be important. However, on large sites, such as factory estates or mineral working, planning conditions may affect operations.

The disposal and final use of the development may be restricted once the development is complete. Disposal may be by sale or lease, or the developer may use the property himself. In any event, conditions imposed with the planning permission run with the land. Conditions that may affect the development at this stage involve the maintenance of landscaping and restriction on occupancy. During building and disposal stages the local authority checks that development has been carried out as approved. If there have been major departure then the Local planning authority has to decide whether to take action. Thomas op cit. summarises the major issues in development control as follows:

- i) Sitting
- ii) Design
- iii) External appearance
- iv) Access
- v) Landscaping

2.6 THE URBAN CHALLENGE

Devas, et al, 1993 recognises that planners and managers of the cities of the developing world face an enormous task. The world's urban population is growing at a phenomenal rate: In some cities more than a quarter of a million people are added to the total each year, overwhelming efforts to improve conditions, while cities which are already larger than any known in the past continent to expand without any apparent limit. This poses a huge challenge to those responsible for the management of urban development and the provision of services.

Devas op cit. suggests that all the evidence indicates city planners and managers have failed to meet this challenge. Large numbers of citizens are left without adequate shelter and without access to safe water or sanitation, while the haphazard pattern of urban growth have caused economic inefficiency, environmental degradation and human misery. Over the years, city planners and managers have made attempts to bring the situation under control, but with few exceptions their efforts have proved totally inadequate.

2.7 NEIGHBOURHOOD PLANNING CONCEPT

The concept of the neighbourhood as a distinctive residential area was advanced by Clarence Perry in 1929 and has been used in the planning of new towns. The town is planned to contain

units of between 5,000 and 10,000 people, each unit having its own low-order centre supplying convenience goods, medical facilities, and primary education, all within walking distance. Through traffic is discouraged. Most of the early British new towns were designed on this principle, with the aim of fostering a sense of community in each neighbourhood unit. The neighbourhood unit was designed to create a semi-public space within newly industrialising American cities that offered limited opportunities of incoming workers and workers' children to integrate and foster a community spirit in an alienated urban environment.

Opposed to increasing distances between places of residency and places of work it was focused on a walker metrics i. e. the city layout where key points are not located further than within an average walking distance. The local school or churches are considered to be central nodes of the unit. The number of children at school or members of the congregation thus determined limits of the neighbourhood district ranging from 5,000 to 10,000 representing the number of expected density of the population.

Desired proximity of local shops was about a quarter of mile within the district, the distance of the school from the borders of the district was half a mile maximum. The concept of the neighbourhood unit was meant to enhance the feeling of identification with the environment for incomers, support their spatial integration, foster social cohesion and avoid social pathology, taking the form of alienation and civic indifference. (Nick Devas et al, 1993)

2.8 PHYSICAL PLANNING IN KENYA

2.8.1 Local physical development plan

The Physical Planning Act, 1996 empowers the Director of physical planning is to prepare with reference to any government land, trust land or private land within the area of authority of a city, municipal, town or urban council or with reference to any trading or marketing centre, a local physical development plan. A local physical development plan may be a long-term or short-term physical development or for a renewal or redevelopment, the plan may be prepared for the general purpose of guiding and coordinating development of infrastructure facilities and services for an area and for the specific control of the use and development of land for the provision of any land in such an area for public purposes.

A local physical development plan should consist of:

- a) A survey in respect of the area to which the plan relates carried out in such a manner as may be prescribed;
- b) Such maps and description as may be necessary to indicate the manner in which the land in the area may be used having regard to the requirement set out in relation to each type of local physical development plan.

A local physical development plan that has been approved shall not be altered in any manner without prior authorization of the Director of physical planning.

2.8.2 Control of Development

The Physical Planning Act op cit. empowers each local authority to carry out the following within its area of jurisdiction:

- a) To prohibit or control the use and development of land and buildings in the interest of proper and orderly development;
- b) To control or prohibit the sub-division of land or existing plots into smaller areas;
- c) To consider and approve all development applications and grant all development permissions;
- d) To ensure the proper execution and implementation of approved physical development plans;
- e) To formulate by-laws to regulate zoning in respect of use and density of development; and
- f) To reserve and maintain all the land planned for open spaces, parks, urban forests and green belts in accordance with the approved physical development plan.

The Act op cit. further states that no licensing authority should grant, under which any written law, a license for commercial or industrial use or occupation of any building, or in respect of any premises or land, for which no development permission has been granted by the respective local authority.

The Act op cit. clarifies:

- a) Commercial uses to include shops, offices, hotels, restaurant, bars, kiosks, markets and similar business enterprises and trade but does not included petroleum and filling stations;
- b) Industrial use to includes manufacturing, processing, distilling and brewing, warehousing and storage, workshops and garages, mining and quarrying and other similar industrial activities including petroleum filling stations.

The Act op cit. binds each local authority to:

- a) Any relevant regional or local physical development plan approved by the minister;
- b) Have regard to any comments received from the Director, officers or other authorities;
- c) Have regard to the health amenities and conveniences of the community generally and to proper planning and density of development and land use in the area;
- d) In the case of leasehold, have regard to any special conditions stipulated in the lease.

2.9 LOCAL GOVERNANCE IN KENYA

Local governance in Kenya is spelt out in the Local Government Act, Cap 265 together with the various functions of all local authorities. A local authority may:

- i) Establish and maintain wood lands;
- ii) Establish and maintain either by itself or jointly with any other authority or any association hospitals, maternity services, health centres and dispensaries within or without its area of jurisdiction;
- iii) Establish and maintain recreation grounds and facilities for recreation on land belonging to, and parks, squares and open spaces vested in it;
- iv) Establish, maintain and assist institutions, day nurseries and clinics for the care and welfare of infants, children, and juveniles and make provision for suitable instructions being imparted to expectant mothers of such infants;
- v) A municipal council may, with the consent of the minister, establish and maintain schools and educational institutions, including boarding blocks and school hostels.

The Act op cit. empowers every municipal council, town council and urban council to:

- a) Establish and maintain sanitary services for the removal and destruction of, or otherwise dealing with all kinds of refuse and effluent and, where any such services are established, to compel the use of such services by persons to whom the service is available;
- b) Layout and adorn any square or open space belonging to it by any architectural scheme or ornamentation, including the erection of statues, fountains and other structures;
- c) Construct footways along the side of any road or street, and to pave or surface any road or street and to pave or surface every such footway, and to recover from the owners of land abutting upon such footways the whole or any part of the expenses incurred in such construction, surfacing or paving where such construction, surfacing or paving was requested by such owners, and to control the construction surfacing and paving of footways, where such works are carried out by any such owners.
- d) Control or prohibit the sub-division or cutting up of land or the sub-division of existing building lots into small areas; to provide that no transfer of any such sub-division shall be registered in any land titles registry unless and until a certificate under the hand of the clerk of the local authority or such other person as the local authority may appoint for the purpose, has been produced to the registration officer, who shall register the same against the title to such land at the cost of the applicant for such sub-division, to the effect that the local authority has approved of such sub-division and to prevent the withdrawal, cancellation or alteration, except with the consent of the local authority, of any sub-divisional plan which has been approved by the local authority;
- e) Prohibit and control the development and use of land and buildings in the interest of the proper and orderly development of its area;
- f) Establish and maintain sewerage and drainage works within or without its area;

- g) Lay out building plots or otherwise sub-divide any land acquired or appropriated by it, whether within or without its area, for the purpose of housing schemes for the inhabitants of its area.

2.10 HOUSING POLICY

The first comprehensive housing policy for Kenya was enunciated in 1966/1967 as Sessional paper no. 5. This housing policy was based on the Government facilitating individual home ownership. However, a lot of land speculation has taken place, pushing housing out of the reach of the poor and creating squatter settlements.

Parliament adopted Sessional Paper No. 3 on the National Housing Policy in June 2004. The policy, which replaced the previous one, is intended to serve as a guide for housing development to cater for all incomes groups in the country. The Government aims at facilitating the annual production of 150,000 housing units (urban areas) and the improvement of 300,000 rural housing units. In addition, the Government has also unveiled its Vision 2030 program with housing being recognised as a vital element of realization of development forecasts.

2.11 POPULATION, URBANISATION AND HOUSING

The Republic of Kenya: Medium Term Plan 2008 – 2012, summarises population, urbanisation and housing issues as follows; High population growth, rapid rural - urban migration, skyrocketing costs of housing construction materials and high costs of housing finance and their implications on socio-economic development that have been of concern and a challenge to the government since independence.

Rapid urbanisation mainly due to rural-urban migration and high urban growth rate are significant dynamics impacting on the socio-economic development of the Kenyan society. This to some extent is a result of the limited capacity of planning agencies in terms of the requisite technology, human resources and financial outlay, to prepare timely and sustainable physical development plans. Consequently this has led to constraints in provision of water, sanitation, security infrastructure, housing and transportation.

Urban areas are symbols of prosperity and thus are engines of growth. The concentration of activities in urban areas allows for specialisation and exchange-processes which are essential to economic growth. Nairobi in its current state, for instance, contributes to about 50 per cent of Gross Domestic Product in the country. It is these attributes that have made it a regional hub in terms of service provision.

The housing sector is characterised by inadequacy of affordable and decent housing, low-level of urban home ownership, extensive and inappropriate dwelling units, including slums and squatter settlements. This is attributed to under-investment in low and middle-cost housing by both the public and private sectors. Other constraints include an out dated legal and regulatory framework, uncoordinated policy implementation, low private sector participation, insufficient capacity, poor governance, and inadequate financing to buyers and developers. In addition, research on low cost building materials and construction techniques has been limited thus not providing viable guidance to the development of the low cost housing in the sector.

2.11.1 The state of housing

The demand for new housing units in urban areas currently stands at 150,000 units annually and only 23 per cent of this demand is being met, the national gap is big and the shortfall is more acute among low-income households whose present demand is about 48 per cent of total new houses required in Kenya. Currently, more than 80 per cent of new houses produced are for high and upper middle income earners. Because more than 60 per cent of the Kenyan population is younger than 25 years, it is clear that the demand for adequate housing will rise steadily as those aged 20 and below reach adulthood and start family life.

However, the Kenyan urban housing sector is characterised by large urban slums without proper sanitation. Informal settlements house 60 per cent of urban population. In rural areas, the quality of housing is inadequate and access to clean drinking water and energy is low. Approximately 35 per cent of Kenyan households live in one-room housing units. The situation is worse in urban areas where 59 per cent of households live in one roomed dwelling. To adequately provide shelter for the projected population of 60 million by 2030, and assuming the household size of 5 members per household, the projected housing demand for the country would be more than 12 million dwelling units by the year 2030.

2.11.2 Challenges and opportunities

Kenya's housing sector is grappling with several challenges. These include a huge gap between demand and supply of residential houses, inadequate investment in the housing sector, low access to finance by buyers and developers and lack of a supportive legal and regulatory framework. The key challenges in urban development and housing facing Kenyans as the country develops to 2030 include the following:

- i) *Inadequate capacity for urban and regional planning*

- ii) *Insufficient serviced land*
- iii) *Concentration of property development in the high-income category*
- iv) *Legal and administrative reforms*
- v) *Supply of affordable finance for mortgages and property development*
- vi) *Lack of adequate construction capacity*

2.12 ACTORS IN SHELTER DELIVERY AND THEIR ROLES

2.12.1 Government

Housing is financed and supplied through a number of channels that include the Ministry of Housing, the National Housing Corporation (NHC) and Local Authorities. Land administration is the responsibility of the Commissioner of Land. Ministry of Water oversee water supply and sewage networks in towns where these are not run by the local authority privatized firms. Kenya Power and Lighting has the monopoly on electricity generation and supply.

2.12.2 External Support

Two innovative techniques used in the past include, the World Bank Secondary Towns Project and the USAID Housing Guarantee Project.

2.12.3 Non-Governmental Organizations (NGO)

There are several NGOs that have made commendable efforts in community mobilization in low-income settlement.

2.12.4 Financial Institutions and Micro-Finance Agencies

The housing finance sector has not been able to adequately respond to housing needs of the various categories of Kenyans in both urban and rural areas. This has resulted in innovative lenders within the micro-finance concept.

2.12.5 The Cooperative Housing

There are about 500 registered societies that improve shelter and infrastructure within the informal settlements while also generating income.

2.13 SHELTER DESIGN

2.13.1 Land use

The high demand for land by competing interest groups i.e. Government, private sector, residential groups and individuals has pushed the prices up. Public land is almost exhausted in urban areas while most of the available land is unplanned and has no basic infrastructure. Insecurity of tenure and the slow procedure of issuing title deeds for land have been a major handicaps.

2.13.2 Building materials/technology

Building materials constitute the single largest input in construction and account for over 70% of the total cost. The high cost of traditional building materials (stone and mortar) has limited the quantity and quality of housing stock produced in the country. New faster housing delivery technology (prefabs) has failed to take off.

2.13.3 By-laws and Planning Regulations

The current building regulations have tended to favour high-income earners by specifying very high standards. The out dated building code regulations and zoning laws make housing expensive and encourage non-adherence to regulations. The Grade II by-laws, which were meant to be friendly to low income earners have not been adopted by many local authorities.

2.13.4 Enabling Legislation

The provision of housing is regulated by various Acts of Parliament and delegated legislation. In the process of planning, designing and implementing housing projects, delays are experienced because of the need to refer to the various laws. However, the approved Sectional Properties Act has in a way encouraged investment in high rise flats by private developers.

2.13.5 Capacity

Limited institutional capacity in both Central Government Ministries and Local Authorities and inadequate co-ordination of actors often lead to duplication of efforts. The Minister of Housing cannot direct any action in the housing sector because s/he has no such legal powers. (Joab Awalla, 2006)

2.14 NAIROBI MASTER PLAN FOR A COLONIAL CAPITAL-1948

The Nairobi Master Plan, 1948 (NMP, 1948), states that the general design of residential areas in Nairobi like most other cities of the world, at first grew without following any town planning principles at all. There was plot to plot development as one by one were sub-divided and slowly covered with buildings. Such development recommends itself to speculative interest and is inexpensive to the municipality, especially if plot owners have to make up their own streets according to the private street ordinance. The disadvantages of such development however, became evident very soon in the growth of Nairobi as its history shows. There was want of design, roads lacked all system and were faulty in construction or kept in a state of disrepair. Public buildings were few and shops huddled together. The town lacked focus engineering services were inadequate and expensive because of the untidy and sprawling development. Most serious of all there was overcrowding as estate owners tried to increase the value of undeveloped land.

To remedy the defects, municipalities have taken refuge in grid-iron layouts which impose regular pattern ideal for the purposes of municipal engineering departments and the services it maintains. The pattern is not only easy to layout but also easy to survey and sub-divide. A maximum frontage is gained which is convenient to commercial interests. The grid-iron pattern is wasteful of roads and space and tempts the engineer to disregard contour. It sets a premium upon sprawl and ribbon development and prevents the healthy growth of a communal spirit and organization. The mechanical way of single storey houses or single family houses does not make allowance for those who wish to live in flats or desire an internal courtyard and communal open space.

In an effort to overcome the effect of the grid-iron layout the garden city idea evolved. It sought to plan along the contours and conceives of town planning primarily as landscape gardening. It wishes to preserve as much of the rural atmosphere as possible in an urban area by restricting densities, discountenancing, flat tenements and excluding non-residential, non-conforming buildings. It gives a great deal of private open space. But it falls short of deliberate encouragement of planning for communal activities and deepening the social bounds within the local community. The design that incorporated the most effectively the principle of social organization was the "Neighbourhood unit" and it was the design which underlies the residential areas of the 1948 Master plan.

2.14.1 The Neighbourhood unit

According to the NMP 1948, the neighbourhood unit is conceived as the aggregate of the number of families required to support one primary school. In area a neighbourhood unit is defined by the maximum distance a child has to walk to school. Planners have taken a unit of 10,000 persons on basis of residential planning while others advocate a unit embracing not more than 2,000 persons. The neighbourhoods are largely self-contained. They include from 1,200 to 3,000 houses and a complementary and balanced provision of open spaces, schools, shops, public buildings and local service industries.

Internal subdivisions, within the neighbourhood would allow a variety of dwellings arranged in groups of 100 – 300 families. Each group would have its own distinctive character, largely dependent on the sizes of the plots and sizes of the dwellings. Flat buildings would be adjacent to the open spaces and near to the neighbourhood's centre where commercial facilities and shops would be most numerous. Density zoning would hinge upon the number of persons per square acre or would be a translation of this into total superficial square feet.

The neighbourhood plan would be prepared for an area within clearly defined limits such as main roads, railways, watercourses and open spaces. It would make provision for a population of from 5,000 to 10,000 and the neighbourhood unit would be:

- a) Small enough to facilitate acquaintance
- b) Large enough provide for diversity of population
- c) Large enough to provide for a full range of local, social, recreational and educational facilities.

Internal roads would be for neighbourhood traffic only. Therefore, no through main roads would serve the units. The selection of land for development and its release in orderly sequence would be made in such a way that neighbourhood units would be properly formed.

In planning the residential areas in Nairobi it was necessary to change the emphasis. It was remembered that in the pre-literacy conditions of Africa, the school did not define the community with the clarity it does in Europe. Schools are themselves more segmented; there are state and mission schools, Mohammedan and Christian schools. Only a minority of children go to school. More is the community characterized by a normal age and sex distribution.

The very "newness" of urbanization required a unit of residential organization which was considerably smaller than the figure of 10,000 considered appropriate to greater London. The assemblage of individuals had to be knit together into a community and this would be achieved more easily if the conglomerates are small.

The master plan formulated a programme listing the desiderata which would be as far as possible incorporated in any neighbourhood plan. This was done in the (T.W.L Thornton White & Partners) neighbourhood design and the layout embracing these desiderata as shown below:

1. A plan in which every inhabitant will be aware of all the facilities available in the unit, without any special effort on his part.
2. A plan in which every house:
 - a) Faces the most desirable aspect
 - b) Faces an open park or open space
 - c) Has immediate car access in one side and immediate pedestrian access on the other.
 - d) Is reasonably isolated from main road noise and major noises from other sources
 - e) Is within a quarter of a mile of a nursery school or a small children's play area.
 - f) Is within half a mile of a junior school or an older children's play area.
 - g) Is within three quarters of a mile of a shopping and community centre.
 - h) Is within a quarter to half a mile of a public transport service.
3. A plan in which each adult:
 - a) Has three alternative means of going from house to shopping and community centre: by personal road transport (cycle or car), by public road transport, or on foot, provided always that the pedestrian approach is the shortest approach and does not cross a major road.
 - b) Can walk to a bus stop by the shortest route without crossing a traffic road.

- c) Can take a young child to school and continue to the shopping centre without making journeys in opposite directions i.e. walking further than is necessary.
 - d) Can have complete privacy in his own house and garden, if he wishes it.
4. A plan in which each road:
- a) Is specifically designed to take a particular kind of traffic, with a clear distinction between main roads and side roads, giving access to houses.
 - b) Has no side walk because all footpaths are separated and it is quicker and shorter to walk along the segregated foot paths, than along the roads.
 - c) If it is a main road, is generously wide, has no houses along it, and forms a clearly defined bus route.
 - d) If it a side road is so planned that it cannot possibly develop as a through road and is, therefore, of minimum width and of light land construction, and safe.
5. A plan in which each public service (i.e. water, gas, electricity, sewerages).
- a) Is progressively and economically organized, much the same as the blood circulation is organized in man.
 - b) Is located in open parkland and not under roads or footpaths.
 - c) Is planned to cross roads and paths at right angles where such crossings are unavoidable.
6. A plan in which sufficient open spaces, centrally situated, is reserved for future public buildings, without the need for later expensive acquisition or unnecessary re-planning.
7. A plan in which all public buildings (shopping, community halls, local offices, libraries, clinics, recreation halls, sports, grounds, etc.) are grouped together for the convenience of the public and for economy in services and maintenance.

2.15 NAIROBI METROPOLITAN GROWTH STRATEGY OF 1978

The Nairobi Metropolitan Growth Strategy of 1978 (NMGS 1978), introduces the concept of a comprehensive plan to direct Nairobi's growth and development that emerged around 1967 from a series of sectoral pressures: an impending water shortage, a road system increasingly unable to accommodate the growing traffic, and spreading, deteriorating, shanty areas as rising numbers of low income migrants worsened the city's housing shortage.

In the formulation of a development strategy for any city, it is necessary to work towards a series of objectives directly related to that city's problems, present and projected. Planning does not consist only of economic and demographic projections, but includes the application of public policy to such projections to achieve the goals of the city and nation.

The physical layout of metropolitan Nairobi needed to:

- Ensure that the recommended urban structure is able to accommodate a greater measure of growth than the maximum, without losing its identity or coherence.
- Minimise the cost of human settlement and the cost of public infrastructure, particularly with respect to personal movement.
- Relate closely the provision of employment centres and low-cost housing development.
- Necessity of striving for congruence of authority and responsibility that is of ensuring that the planning area has effective policy-making and implementation machinery.

The theoretical forms of city structure falls into two broad classes:

- a) Accretive growth, in which additions to the city are made around the periphery as well as by increasing density in the centre.
- b) Lineal growth, in which development is located in one or more new or expanded towns physically separate from the principal urban area, the growth of which would be restricted.

Seven potential areas of expansion emerged, these were:

- a) Linear development linking Thika and Nairobi
- b) A new city at Thika

- c) Eastern extensions of Nairobi
- d) Eastern extensions of Nairobi and development at Athi River
- e) Extension of Nairobi to the North, East and, minimally, West.
- f) North and North-East extensions to Nairobi
- g) A new city at Athi River

With higher densities, a more compact built-up area and therefore a more economical transport system normally results. The disadvantages of a linear form of development is that, more roads would be required, public transport would be more expensive and infrastructure costs would rise.

2.15.1 Housing areas

An area containing 5,000 people would be served by a nursery and primary school, and a local shopping centre and market, 25,000 people would support, in addition, one or two secondary schools, a petrol station and a large shopping centre and an area with 250,000 people would contain a further major commercial and administrative centre, an institute of further education, and a cinema.

2.15.2 Social structure

Social organisation which would result from the structural plan proposal was also to be considered one of the basic goals in planning the city. The social organisation inherent in the recommended strategy expressed the need, as the central city grows, to form sub-cities or communities' each with its own centres. These centres would contain retail facilities, market, services functions (repair shops, personal services, medical services, etc.), city and national government offices and auxiliary facilities, secondary and higher educational institutions, recreational areas and entertainment of various kinds. Each community, in terms, would comprise a number of neighbourhoods centred on schools with their recreation fields, and provided with shops and others services.

2.15.3 Descriptions of the strategy by area

2.15.3.1 Urban land reserve

Upper-income housing were to be left to private financing and construction, the role of the city would be limited to ensure that land for roads, parks, schools and other public purposes was reserved and that each sub-divider contributed his/her fair share of such public land.

2.15.3.2 Housing

Recommended policies can be summarised as follows:

- a) Development of a realistic planning strategy for all income groups aimed at providing each household in Nairobi with an opportunity to buy, rent or build for themselves housing they can afford.
- b) Determination in investment planning of an appropriate portion of the city's Gross Domestic Product to be allocated to housing investment (private and public), including provision of necessary land and basic facilities and services. This proportion, estimated at 3.33 per cent would need to range between 6.00 and 8.00 per cent. Meeting the housing needs of the lower half of the city's income groups, however, would require only about 1.50 per cent of the GDP, well within the city's resources, provided that available public investment funds were re-allocated to these groups.
- c) Development of a year – by – year programme indicating how many and what kind of housing units were to be built in each income level and how they were to be financed, including co-ordination of public, private and international sources. In addition, it was necessary to determine the necessary annual inputs-land, building materials, labour – and steps to be taken, such as manpower training, land acquisition, development of building materials industries, and establishment of house building and financing institutions.
- d) Development of housing and environmental standards appropriate to various income levels and ensuring health and safety, along with a review of building codes and by-laws to bring them into line with such realistic standards.
- e) Institution of programmes of manpower training for those who would be needed to carry out a broad housing programme.
- f) Intensification of programmes of building research into the use of local materials both as substitutes for imports and as a means of creating employment. Such research would not be limited to housing but would also include commercial and industrial construction. Emphasis would be placed on feedback from all projects to all incomes groups so as to channel experience and know how gained in the early years of the programme and thus

avoid repeating mistakes and to ensure progressive improvement, economy of effort and continuity.

- g) Limitation of public subsidies to the provision of land and services for the lower income groups rather than to provide a number of middle-income families or absentee investors with below market rents.
- h) Emphasis for the lower income groups was to be placed on the following:
 - i) Improving existing squatter settlements rapidly through provision of basic services, regulations of land tenure and preservation and improvement of existing housing stock rather than on redevelopment programmes involving demolition of existing housing. Such housing would only be demolished if it stood in the way of public improvement scheduled for construction.
 - ii) Provision, year by year, of sites for aided self-help along site and service lines and for minimum standard of public housing to meet the needs of the lower income groups – estimated at 40 per cent of the city's growing population.
 - iii) Assistance to co-operatives, private building companies, and individuals undertaking to provide housing at costs these income groups can afford and complying with density and environmental controls of the development strategy and the revised standards, building regulations and by-laws as recommended. Such assistance could include financing as well as developing sources of finance, help in securing building approvals, centralised purchase of building materials, skilled provision of self-help efforts, community organisation workers in newly developing areas.
 - iv) Maximising use of inexpensive local building materials, simple building techniques, labour – intensive building methods, development of small-scale building organisations, and other ways of maximising local employment with little or no input of capital equipment or foreign exchange.

- v) Developing types of housing most easily improved and enlarged as their occupants become able to afford a better standard particularly the avoidance of multi-storied structures incapable of enlargement.
- vi) Designing homes for sub-letting, thus increasing the number of households provided with shelter and adding to the incomes of families willing to build or finance housing for themselves and others.

2.16 THE NAIROBI METRO 2030

The Nairobi Metro 2030 (NM 2030) stipulates that the Nairobi metropolis will be built upon 7 building blocks. These building blocks are:

1. Building an internationally competitive and inclusive economy for the metropolitan regions prosperity. In this respect, the economic agenda for the NMR is going to built on the following building blocks namely:
 - Regional and global financial and business services
 - Bringing the world to Nairobi metropolitan region: A Tourism initiative
 - Building the Jomo Kenyatta International Aerotropolis
 - Regional and Global Education
 - Industrial and Technology Park Initiative
 - Enhancing client orientation in works organisation.
2. Deploying world class infrastructure and utilities for the region – These will focus on the following.
 - Water supply and sewerages services
 - Storm water drainage and flood mitigation
 - Energy services
 - Solid waste management plan

- Information and communication infrastructure plan

3. Optimising mobility and accessibility through effective transportation – in this regard, intervention will focus of the following:

- Metropolitan road transport infrastructure programme
- Public transport programme
- Traffic management programme
- Transport safety programme
- CBD Access strategy
- Demand management strategy
- Logistics and supply chain management
- Land use measures
- ICT in Transport programme

4. Enhancing the quality of life and inclusiveness in the region – This will require intervention along the following areas, namely:

- Housing and elimination of slums
- Environmental management strategy
- Enhancing strategy to medical services strategy
- Enhancing access and performance of education
- Urban regeneration strategy
- A balanced land use strategy for the Nairobi Metropolitan region.
- Development control plan and regulations.

5. Making the Nairobi metropolitan region the place of choice – the measures will be implemented through the following elements:

- Branding and promoting the Nairobi Metropolitan Region

- A Nairobi Metropolitan region heritage and culture strategy
- An identity building urban design and landscaping strategy

6. Ensuring a safe and secure Nairobi Metropolitan Region – in this respect three strategies will be employed focusing on:

- An effective metropolitan policing strategy
- Metropolitan street lighting programme
- Building an effective metropolitan fire fighting service
- Building an effective metropolitan ambulance service

7. The implementation framework – Taking cognisance of the potential incapacity to implement policies, this strategy proposes a robust and comprehensive implementation framework focusing on:

- Planning and allocation of resources
- Metropolitan governance
- Management of strategic change
- Indicators and measuring progress

2.17 THE 2005/2006 POLICY REVIEW FOR ZONES 3, 4 AND 5

The 2005/2006 development policy review profiles zones 3, 4 and 5 covered the following areas, namely:

- Zone 3-** Parklands, City Park Estate and Westlands (includes the Westlands CBD area and the Museum Hill area).
- Zone 4-** Lower Spring Valley, Riverside Drive, Kileleshwa, Kilimani, Thompson and Woodley/Ngong Road
- Zone 5-** Upper Spring Valley, Kyuna, Loresho and Lavington/Bernard Estate

The development policy guidelines for the zones 3, 4 and 5 are shown in the table 2-1 below.

Table 2-1: Previous development policy for zones 3, 4 and 5

Zone	Areas Covered	Ground Coverage %	Plot Ratio %	Type of Development Allowed	Min Area (Ha)	Remarks / Policy Issues
3	Parklands	50	100	Commercial / Residential (High-rise Flats)	0.05	Policy under Review
	· Commercial	35	75			
	· Residential					
	City Park Estate/Upper Parklands	35	75			
3	Westlands	80	200	Commercial/ Offices/ Residential (High-rise Flats) Four Storey max.	0.05	Policy Under Review
	· Westlands CBD	35	80			
	· Westlands/Museum Hill	80	200			
	· Block 1 Commercial					
	· Block 2 & 3 offices and High-rise residential.					
	· Block 4 offices					
	· Block 5 Commercial/Residential					
4	Spring Valley	35 (s)	75 (s)	Residential (Apartments allowed on sewer only) - 4 storeys max.	0.05	Policy Under Review
	Riverside Drive	25 (u)	25 (u)			
	Kileleshwa					
	Kilimani					
	Thompson					
	Woodley					
5	Upper Spring Valley	25	25	Low density Residential One Family House	0.2	Maisonettes allowed on sewered areas of Lavington.
	Kyuna	35	75			
	Loresho	25	25			
	Lavington/Bernard Estate					
	· On Sewer (s)					
	· Unsewered (u)					

Source: City Council of Nairobi, 2004

2.17.1 Development Challenges in Zones 3, 4 and 5

Development had outpaced forward planning intervention measures; the developments were mainly driven by the demand for housing, commercial and office developments. This elicited public outcry from the residents who voiced various concerns that the developments were being carried out without commensurate upgrading of the existing level of infrastructure to support the housing, commercial and office developments; which were likely to have unprecedented

negative social and environmental impacts. The problems identified were classified into the following broad categories:

a) Infrastructure Development

The character of the developments indicated a demand-led instead of an infrastructure-led type of development. The implementation of plans for development of infrastructure was inadequate and ineffective. The housing, commercial and office developments were exerting undue pressure on the existing level of infrastructure. The sewerage lines required upgrading in order to adequately service the increased levels of sewage discharge due to rising levels of development. The problem manifested itself in the form of blocked sewerage pipes and overflowing liquid and solid waste. The zones equally experience reduced water supplies particularly during the peak periods.

The developments equally generated high volumes of surface water run-off which particularly exerted pressure on the existing road network and the river line drainage way leaves. This led to problems of flooding coupled by the wearing off of the road surfaces since the roads had not been widened and upgraded with commensurate increase in the widths of the storm water drainage channels. These roads, which were receiving higher population numbers, needed to be provided with pedestrian walkways, cyclists routes and to be developed with street lights. Other infrastructure services that were to demand attention were effective and efficient means of solid waste management and accessible facilities for fire fighting.

b) Transportation

The increased numbers in the population were generating trips which were split into the modes of vehicular, pedestrian and cyclists' traffic. The properties whose land-use had been changed to multi-dwelling units, commercial and office developments did not have adequate parking at plot level. This caused motorists to indiscriminately park on the road reserves, which inevitably led to loss of green open spaces, traffic congestion and imminent road accidents. Property developers were equally not surrendering part of their plots to give way to road widening. The carriageways were therefore not able to accommodate re-aligned storm water drainage channels and well-segregated non motorized transport routes in the form of pedestrian walkways and cycle tracks.

The entry and exit points to developments were equally not properly developed to allow for deceleration and acceleration lanes which exacerbate the problem of imminent accidents.

Public transport infrastructural facilities were not developed alongside the increased levels of traffic volumes. This led to unprecedented levels of traffic congestion along the public transport routes and at terminal facilities such as bus stops. Other problems were related to ineffective maintenance and upgrading of roads, which occurred in the form of potholed roads and inadequate road signage.

c) Housing Developments

In the three zones about 20 per cent of the people had embraced the force of redevelopment and desire to have plots changing use from single family to multi dwellings units. However a substantial 80 per cent of the residents preferred to have the status quo prevail. There was need to evaluate the overall carrying capacity of the area, undertake a census of the people in the three zones to determine the size of population that could be accommodated, the aggregate number of housing units in the entire three zones, the total number of households, parking spaces and ground and plot coverage at plot level. This was to be correlated with the infrastructure and the community facilities.

d) Community Facilities and Social Infrastructure Services

The increased population in Zones 3, 4 & 5 accommodated in the housing, commercial and office developments had not been adequately provided with a commensurate increase in the community facilities and services. These included recreation facilities (such as public open spaces, playgrounds and sports facilities), education and health facilities, social and community halls, religious facilities, homes for special needs, police stations, post offices, administration facilities and cemeteries. The inadequacy of these facilities had led to unplanned and spontaneous change of use of other properties to accommodate these deserving community facilities and services.

e) Juxtaposition of Incongruous Developments

The increased population in these previously-pure residential neighbourhoods had equally attracted heavy commercial developments such as the Yaya Centre along Argwings Kodhek

Road and Nakumatt Ngong Road and at The Junction and Uchumi Supermarkets along Ngong Road, among others. This retail-oriented development magnetically attracted and generated huge traffic volumes along the main arterial routes that led to traffic congestion. This problem was equally replicated in Westlands and Highridge shopping centres due to the location of The Sarit Centre, Uchumi Hyper, Nakumatt Ukay, Nakumatt Highridge and Diamond Plaza among others.

There was demand for these types of commercial developments, office-use developments and several others including; bars, restaurants and residential hotels, which had sprawled beyond the areas initially designated as commercial zones. There was great resistance by developers to conform to previously-zoned commercial zones. This was particularly experienced on the main arterial routes such as Ngong Road and Waiyaki Way.

This saw the change of use of previous housing units and properties to commercial developments to; bars, restaurants, residential hotels, offices and others to multiple uses. Which resulted in a character of mixed-use development outside the zoned commercial centres. The misinterpretation of the planning guidelines as a result of precedence already set by previous developers had resulted in incongruous developments juxtaposed to each other.

f) Land Values

Various developments in zones 3, 4 and 5 had experienced either a sharp rise or a drop in their land and property values. The rise in land values was partly attributed to the off-loading of public land - previously owned by the government, the City Council of Nairobi and other parastatals such as the Kenya Railways Corporation and Telkom - to private developers. This had compelled developers to seek for over-maximization of development beyond the permissible ground and plot coverage, which propelled the land values even higher. There was need to harmonize the permissible ground and plot coverage against the total number of housing units per acre or hectare.

The drop in property values was partly attributed to private developers who had constructed more than the required number of housing units by exceeding the permissible plot and ground coverage for the zones. Previously the policy guidelines had allowed for 8 units per 0.5 acres (160 persons per hectare) but developers were later allowed to erect up to 16 units per 0.5 acres. This translated to about 64 people per 0.5 acres (320 persons per hectare).

This implied that development control guidelines were not adhered to and previous planning policy guidelines for the zones were not respected. The phenomenon of excess coverage was propelled by the developers need to recoup their investments particularly due to the stringent lending requirements from mortgage and financial institutions. It was equally clear that plot and ground coverage guidelines had not responded to economic dynamics such as the rate of returns on investments, prevailing interest rates, repayment periods, monthly instalments, etc.

g) Environmental Impact Assessment

The existing trend of developments was leading to adverse negative impacts on the zones, to other neighbouring areas and to the entire city. It was incumbent upon the City Council of Nairobi (CCN) and/or the National Environmental Management Authority (NEMA) to undertake a comprehensive environmental impact assessment of all the developments in zones 3, 4 and 5. This would appraise the impacts of these developments on the zone itself, to other parts of the city and to the entire city of Nairobi in general. A comprehensive EIA report for the entire zones 3, 4 and 5 was necessary as a reference and advisory document, more particularly with a complete and detailed environmental management plan for the whole area.

h) Development Control

Although Zones 3, 4 and 5 had been protected from the perverse unplanned phenomenon that had characterized the eastern side of the city, it had come under exceeding pressure and increasing experiencing unplanned development and incompatible uses. An examination of the development profile revealed existence of the following:

i) Developments that had maintained the status quo.

ii) Developments that had been approved and implemented in compliance to the existing land development policy for their specific zones.

iii) Developments that had been approved by the City Council of Nairobi but had been implemented contrary to the approved planning briefs and approved drawings of the building developments

iv) Developments that had equally been approved and implemented but in non-compliance and contrary to the existing land development policy for their specific zones.

v) Developments that had not been approved but were already implemented.

The above scenario pointed at weaknesses and loopholes in the implementation and enforcement of the land development policies by the City Council of Nairobi. There was need to strengthen development control and build partnership with stakeholders in matters of planning and development in shaping the future of the three zones.

2.17.2 Organization

The lead planning agency, the City Council of Nairobi entered into collaboration with University of Nairobi, the School of the Built Environment, particularly, the Department of Urban and Regional Planning, Department of Physical Planning (Ministry of Lands and Housing) and the Nairobi Water Company. A joint taskforce from the above institutions spearheaded the exercise. Various consultations and focus group discussions were held with the joint task force and stakeholders from the three zones that included the residents, residents' associations, developers, institutions and professional consultants. This was to introduce the policy review exercise and to get the general feeling, responses and reactions from the stakeholders in the three zones. A feedback consultative meeting was equally held in order to disseminate the preliminary findings to all the stakeholders.

The review exercise went through the following planning stages: Reconnaissance, Collecting background information, Defining the planning area, Preparation of the planning brief, Identification and Sensitization of stakeholders, Data Collection, Data analysis and Synthesis, and Plan formulation.

CHAPTER THREE-DYNAMICS OF THE CITY OF NAIROBI

3.0 INTRODUCTION

This section deals the dynamics of the city of Nairobi to which the Kileleshwa estate is part of. It was deemed inappropriate to discuss Kileleshwa estate in isolation without looking at the larger city of Nairobi, yet many policies that affect Kileleshwa estate are not particularly tailored for Kileleshwa but the entire city and what happens at the city level affects every section of the Kileleshwa estate. The dynamics of the city are therefore discussed below.

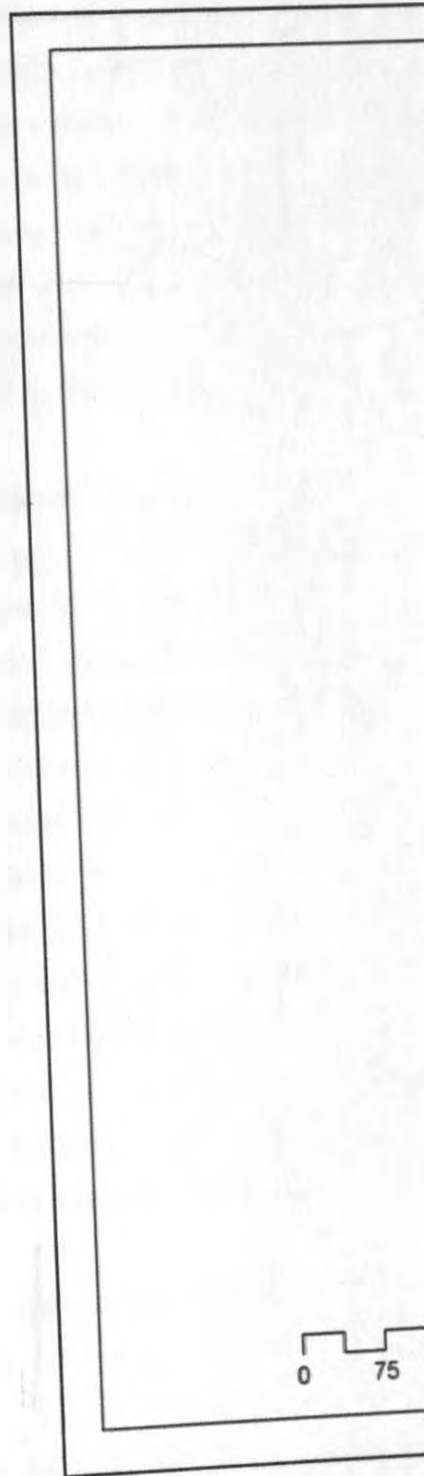
3.1 THE PRIMACY LEVEL AND GROWTH OF THE CITY OF NAIROBI

Nairobi is an equatorial city; it lies at an altitude of 1,670 metres, latitude 36 degrees 50' east and longitude 1 degree 17' south about 140 kilometres south of the equator. The city of Nairobi owes its birth and growth to the Kenya Uganda Railway (KUR). The railhead reached Nairobi in May 1899 "enroute" to the present day Kisumu which was then part of what is Uganda. The moving of the railway headquarters from Mombasa to Nairobi by its chief engineer, Sir George Whitehouse resulted in the subsequent growth of Nairobi as a commercial and business hub of the then British East Africa Protectorate (Situma, 1992:167).

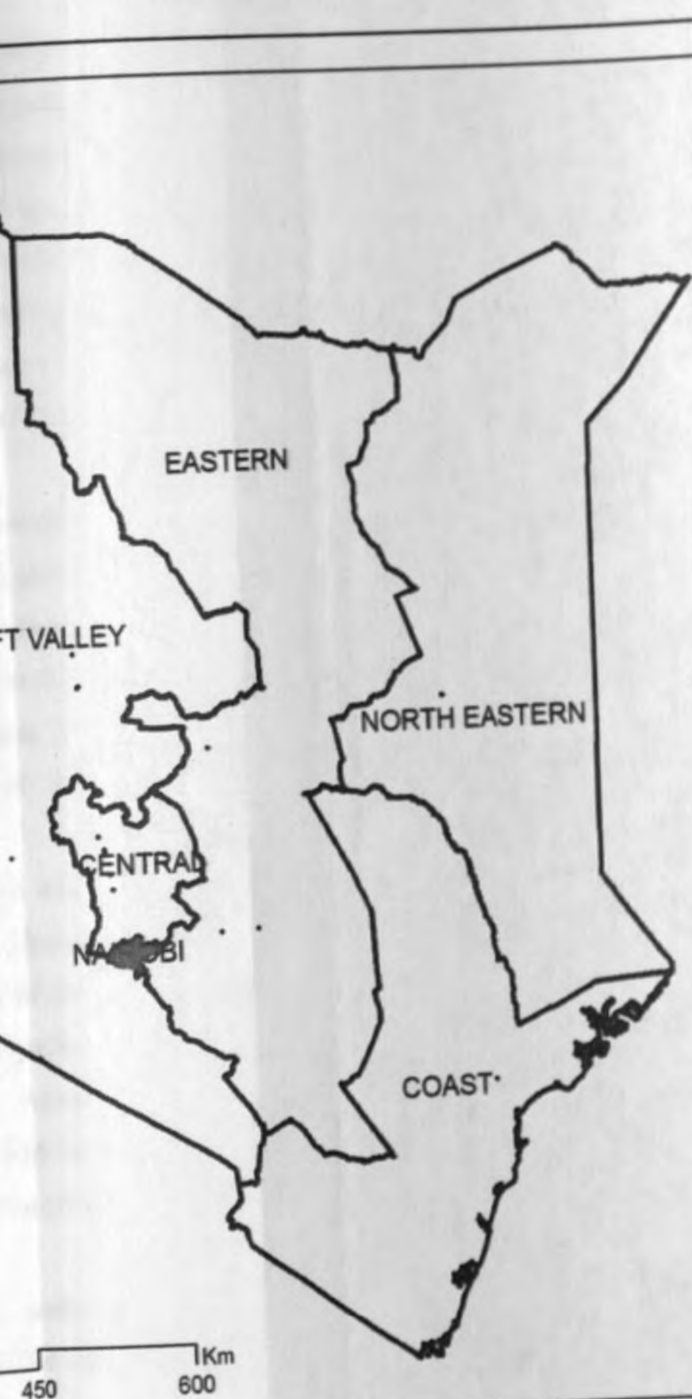
By 1900 Nairobi had already become a large and flourishing place with the settlements consisting mainly of the railway buildings and separate areas for Europeans and Indians, the latter being mainly the labourers employed on the construction of the railway. There was practically no African Settlement. In 1907 Nairobi was made the capital of Kenya. Later in 1950, Nairobi was made a city.

Nairobi's population has continued to increase, resulting into unprecedented growth. At the time of Kenya's independence in 1963, the population of Nairobi stood at about 342,764. Between 1963 and 1979 the population of Nairobi rose from 342,764 to 827,775. According to the 1989 census, the population was at 1.3 million and was expected to rise to over 2 million by the turn of the century (Republic of Kenya, 2001). Map 3-1 below shows the national context of Nairobi.



Map 3-1: The national context of



Source: Adapted from the Survey of K...



Legend

-  Nairobi_Province
-  Kenya Provinces

3.2 EMERGENCE OF SPATIAL PLANNING IN NAIROBI

By 1909 much of the internal structure of Nairobi, especially the road network in the Central Business District (CBD) was already established. The boundary of Nairobi was in 1927 extended to cover 30 square miles as a result mainly of the rapid growth of the urban centre both in terms of population and infrastructure. From 1928 up to 1963, this boundary remained the same with only minor additions and excisions taking place. In 1963 the boundary of Nairobi was extended to cover an area of approximately 266 square miles. From this early growth, the city's functions have developed and expanded such that to-day it has achieved an overwhelming dominance in the political, social, cultural and economic life of the people of Kenya and the whole of the East African region.

Once the KUR authorities made the decision to locate the railway depot in Nairobi, certain spatial patterns started to emerge; the railway station, a shopping centre and subordinate staff housing were established on level land with black cotton soils. Senior railway officers put their homes up on the hill to the west. European colonial officials also established their homes on the hill. Infact, when the East African protectorate headquarters was moved from Mombasa to Nairobi in 1905, Sir Donald Stewart, the Commissioner, himself occupied the house of the former chief railway engineer at the hill. (White et al. 1948:12)

All Europeans who lived in this urban centre created their residences away from Asians and Africans. This pattern soon led to exclusive European residential settlements at Muthaiga, Upper Parklands, Westlands, Loresho, Kileleshwa and Kilimani, among others. Meanwhile, part of the Asian population which had been discharged from KUR employment established shops not far from the railway station, an area which came to be known as the Indian Bazaar. The Asian buildings were used both for business and as living quarters. The few Africans who worked for the KUR were given subordinate housing while others lived in shanty villages in the eastern part of Nairobi. (Obudho, 1987)

Generally, the core of the city is noted for commercial activities, hence the presence of multi-storey buildings. At the core, vegetation cover is rare, as the surface is either bitumized or heavily slabbed with cement. To the eastern and western part of the commercial area is the "medium"/"high"-density residential areas. The "low" – density residential area is found towards the northern, north-western and, part of the eastern parts of the city. Although the south-eastern

part of the city is officially designated as the industrial zone, some industries still spring up in some other sections of the city. (Washington H.A. Olima, 2001)

3.3 FUNCTIONS

Nairobi, as the capital city of Kenya, is a centre of industry, education and culture. It is also the world headquarters of two United Nations agencies, the United Nations Environment Programme (UNEP) and the United Nations Centre for Human Settlements (UN-Habitat) and houses regional offices of other United Nations agencies such as the United Nations Children's Fund (UNICEF), the United Nations Scientific and Cultural Organization (UNESCO), the United Nations Industrial Development Organization (UNIDO) and the United Nations Development Programme (UNDP), reinforcing Nairobi's importance as a diplomatic, commercial and cultural centre in Africa. Its proximity to many tourist attractions both in Kenya and East Africa also puts it at the heart of the regional tourist industry.

3.4 CLIMATE

Nairobi has a temperate tropical climate with two rainy seasons. Highest rainfall is received between March and April and the short rainy season is between November and December. The mean annual rainfall ranges between 850- 1050mm. The mean daily temperature ranges between 12 and 26°C. It is usually dry and cold between July and August, but hot and dry in January and February. The mean monthly relative humidity varies between 36 and 55 per cent. The mean daily sunshine hours varies between 3.4 and 9.5 hours. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast with drizzle.

3.5 DRAINAGE

Nairobi's main drainage follows the regional slope of the volcanic rocks towards the east, while subsidiary internal drainage into the Rift region is confined to the western part. The lava plains east of the Ruiru-Nairobi-Ngong line are underlain by a succession of lava flows alternating with lakebeds, streams deposits, tuffs and volcanic ash. These plains, comprising mainly the Athi plains and the northern section of the Kapiti plain, extend westwards, rising from 4900 feet (1493 m) at the Athi River to 6000 feet (1829 m) in the faulted region near Ngong. The lava plains are crisscrossed with steep-walled gullies and canyon-like gorges, such as those along the Mbagathi valley. Further east this valley widens slightly where soft material is being actively eroded (Saggerson, 1991).

Water draining eastward from the hill area accumulates on the low-lying ground between Parklands in the north and Nairobi-South estate, forming a perched water table above the Nairobi phenolite. The Kirichwa valley tuffs lying to the east of the highway function like a sponge and the contact between them and the underlying impermeable phenolite thus forms a perfect aquifer; a number of channels containing water occur beneath Nairobi.

3.6 SOILS

The rocks in the Nairobi area mainly comprise a succession of lavas and Pyroclastic of the Cainozoic age and overlying the foundation of folded Precambrian schist's and gneisses of the Mozambique belt. The crystalline rocks are rarely exposed but occasionally fragments are found as agglomerates derived from former Ngong volcano. The soils of the Nairobi area are products of weathering of mainly volcanic rocks. Weathering has produced red soils that reach more than 50 feet (15m) in thickness (Saggerson, 1991).

3.7 THE STRUCTURE AND SYSTEM OF GOVERNANCE

Nairobi province is one of eight provinces in Kenya. It is synonymous with Nairobi city, but functions as a State unit. It is the smallest province in the entire country. It has only one local authority – City Council of Nairobi (CCN) – and only one district – Nairobi district. The district is divided into eight administrative divisions and some 50 subdivisions (or locations). Subdivisions are generally named after residential estates. Similarly, divisions are often named after residential estates, but cover a much larger area. For example, Kibera division includes Kibera (the largest slum in Kenya), as well as the affluent estates of Karen and Lang'ata. Provinces are divided into districts, divisions, locations and sub-locations. In terms of governance, Nairobi falls under the City Council of Nairobi, which is supervised by the central Government through the Ministry of Local Government. The 1977 Local Government Act is the main legal statute that governs the operations of the city council.

The city council is composed of 55 elected members. Its day-to-day operations are carried out by the mayor and his elected councillors. There are also 18 nominated councillors who are co-opted to the council. Political developments have strongly influenced the delivery of services to urban dwellers. The council has several departments, including the Department of Environment, whose objective is to ensure that Nairobi residents enjoy a clean, healthy environment through the provision of services such as cleaning and beautification of the city, enforcement and implementation of laws and by-laws, maintenance of existing parks, improvement of council-

administered open spaces and control of leisure parks development. Other functions include, health, primary education, garbage collection, water and sanitation and fire protection services, among others. Over the years, however, its service delivery capacity has deteriorated. The reasons for this includes the fact that existing facilities were not planned to cater for the numbers of people now residing in the municipal areas; population growth rates are high; the resource base is low; there are problems with management; the technical and institutional capacity needed to increase service coverage is lacking; and there is a lack of planning and foresight (Hager, 2006).

The principal sources of revenue are water charges, land rates, house rents, sewerage fees, grants for teachers' salaries, bus park fees, slaughterhouse revenues, and intake from the Nairobi National Park. In 1998, the central Government established the Local Authority Transfer Fund, which allocates 5 per cent of the national income tax to all local authorities in Kenya. These allocations come with performance conditions. There is an increasing shift towards partnerships in implementing urban policy. Examples of these include the Nairobi Informal Settlements Coordinating Committee and the Nairobi Central Business District Association. Such partnerships have evolved from concerns over increasing poverty, lack of funding by the City Council of Nairobi; the deteriorating housing situation in the informal settlements; and recognition of the need to incorporate local communities in prioritizing poverty reduction activities.

Through the Local Government Reform Programme, the Government has committed itself to reforming local governments with a view to giving local authorities more autonomy and enhancing their capacity to perform their role and remove conflict with the central Government. Service delivery within Nairobi would be greatly helped, however, if local governments were given real executive power in the areas of finance and decision making.

3.8 POPULATION DYNAMICS

3.8.1 Population growth

Population is a major driver of environmental change in Nairobi and as such is a determinant of other parameters such as solid-waste-generation rates, land-use patterns and settlement, and water consumption. The population of Nairobi grew from 8,000 in 1901 to 118,579 in 1948 (Rakodi 1997). By 1962, the city had a population of 343,500 people, although some of this could be attributed to extension of the city's boundaries. Between the 1948 and 1962 censuses,

the population grew at an average rate of 5.9 per cent per annum, compared with 7.6 per cent in the previous 12-year period.

Taking the 1999 census figures as a baseline, it is projected that the city's population by the next census in 2009 will be about 3.1 million, and 3.8 million by 2015 (Central Bureau of Statistics, 2001). This increase will put even more pressure on the available resources. Although it covers only 0.1 per cent of Kenya's total surface area, Nairobi already has about 8 per cent of the country's total population and 25 per cent of Kenya's urban population. In 1962, there were over twice as many adult males as females. While the city's population has grown significantly since then, the continued predominance of men in Nairobi can be attributed to the fact that the majority of migrants to the city are men.

3.8.2 Population distribution

The other feature of Nairobi's population is its distribution. In some areas of the city, the population density is quite high. The city's overall population density is 3,079 people per square kilometre (Central Bureau of Statistics, 2001), but this varies significantly across the different divisions. For instance, Central division is the most densely populated with 22,164 persons per square kilometre, while Kibera division has 1,284 people per square kilometre (Central Bureau of Statistics, 2001). Even within divisions, there are differences. Some areas of Kibera division have extremely high densities, especially in the slum areas. This affects the ability of the City Council of Nairobi to deliver services such as health, education, transport and housing, and also to provide recreational facilities.

3.8.3 Age structure

Nairobi's population is young, with 56.5 per cent of the population below the age of 24 years (Central Bureau of Statistics, 1999). The youthful structure of the population causes high dependency ratios and is responsible for high unemployment rates and demands for education, housing, health, transport and other social amenities. The population pyramid of Nairobi does not reflect a normal structure, research findings shows that between the ages of 6 and 19, both sexes decline in numbers but pick up rapidly between the ages of 20 and 29. From then on the pyramid exhibits a normal trend, with a gradual decrease of numbers with age but more rapidly for females than males.

3.8.4 Education

Illiteracy rates in Nairobi for the 15–54 age groups are 7.8 per cent for women and 5.8 per cent for men. Illiteracy levels are lowest in Nairobi, compared to the rest of the country, 21 per cent for women and 12 per cent for males. 56.4 per cent of women and 67.3 of men have attended secondary school and above, compared with 48.2 and 57.7 per cent respectively for urban areas in general in Kenya.

The Government introduced free primary education in 2003. This was intended to broaden access to primary schooling especially among poor households. In all, 85 per cent of children of primary school age (6–13 years) are attending school. The gender gap at this level is quite small, with 85.9 per cent of girls and 84.1 per cent of boys in primary school. The abolition in 2004 of compulsory school uniforms was a policy initiative intended to enhance school enrolment (Oxfam 2004). At secondary level (14–17 years), the net attendance ratio is 32.1 per cent. This is much lower than that for primary schools. Secondary school attendance is higher for females (35.5) than for males (28.9). To address gender concerns in education, the Government is promoting a gender-friendly learning environment with special focus on the provision of water and sanitation.

In Nairobi, 91.4 per cent of non-formal education schools are supported by various civil society groups, 6 per cent by the Government and only 2 per cent by the local authority. The efforts by civil society groups go a long way in complementing the Government's efforts towards free education and need to be encouraged. The main challenges include the low quality of education, lack of linkages with the formal education system, lack of teaching and learning resources, and low prioritization by the Government in terms of allocation of resources (Gathenya 2004). The Government has put in place a policy framework and appropriate legislation that ensures provision of education for all children regardless of their circumstances. These include the Children's Act of 2001 and Sessional paper No.1 of 2005 on a policy framework for education, training and research. The Ministry of Education has also developed the Kenya Education Sector Support Programme for the period 2005–2010.

3.9 THE ECONOMY

Kenya's real gross domestic product (GDP) grew by 5.8 per cent in 2005 against a revised growth of 4.9 per cent in 2004 (Central Bureau of Statistics, 2006). Nairobi is a major contributor to Kenya's economy: it generates over 45 per cent of GDP, employs 25 per cent of

Kenyans and 43 per cent of the country's urban workers (UN-Habitat 2006). The paradox is that the financial capacity of the City Council of Nairobi is extremely limited, largely because of poor resource management and a weak revenue collection system. As a result, there is a 200 per cent shortfall between the revenue collected per capita (\$7 on average) and per capita expenditure (\$21) (UN Habitat 2006).

Although foreign direct investment is small, it plays a key role in Kenya, particularly as a means for technology and knowledge transfer, such as in horticulture and floriculture. Nairobi and Mombasa accounted for 89 per cent of the total number of regional projects registered with the Investment Promotion Centre during 2000–2004 (World Trade Organisation, 2006).

The average annual inflation rate in Nairobi decreased from 13.2 per cent in 2004 to 11.4 per cent in 2005 (Central Bureau of Statistics, 2006). The fall in inflation rate was more pronounced in the lower income group, where the inflation rate decreased from 14.4 to 11.7 per cent over the same period. The lower income group constitutes about 80 per cent of the population in Nairobi. For the middle and upper income group, the inflation rate rose from 8.0 in 2004 to 10.1 per cent in 2005. Inflation is a persistent cause of the rise in consumer prices or decline in the purchasing power of money, caused by an increase in available currency and credit beyond the proportion of available goods and services.

As Nairobi's population increases, so does the demand for jobs. Currently, 56.6 per cent of women and 68.6 per cent of men aged between 15 and 50 are economically active (Central Bureau of Statistics *et al.* 2004). Between 1989 and 1997, the combined formal and informal sector employment growth in Nairobi was 2.3 per cent per annum, less than half that of the rate of population growth (Post Buckley International Inc. 1998). It is estimated that about 500,000 people join the labour force annually. Most of these are unable to secure employment and thus remain unemployed or end up in traditional agriculture and in the informal sector (Odhiambo and Manda 2003). Nairobi commands the largest share of modern sector wage employment in Kenya, with a total of 453,000 people in 2005 (Central Bureau of Statistics, 2006). The main formal employment zones in Nairobi are the Central Business District (CBD) and the industrial area, along Jogoo and Mombasa Road, Ruaraka, Thika Road and Dandora. Although there have been efforts to decentralize employment concentration from the central areas to satellite centres, the CBD and the central industrial area (Jogoo-Mombasa Road) still remain the core

employment zones. It is for this reason that the city is often described as being a mono-polar centre.

The informal or “jua kali” (from Swahili: “hot sun”) sector plays an important role in absorbing the unemployed in the labour force that are not able to get into the modern sector. Over the period 1991–1992, the number of people engaged in the informal sector increased by 27 per cent (Rakodi 1997); and from 2001 to 2005, by 38 per cent (Central Bureau of Statistics, 2006). By 2005, 1,548,100 people were engaged in this sector (Central Bureau of Statistics, 2006), about 3.5 times those in wage employment. The informal sector covers small-scale activities that are semi-organized, unregulated and uses low and simple technologies while employing few people.

3.10 POVERTY

In 1997 Nairobi had 51 per cent of its population living in absolute poverty (Republic of Kenya, 2000). Currently, about 44 per cent of the city’s population lives below the poverty line, with the poorest 20 per cent accounting for one half of the city’s poor population (Central Bureau of Statistics 2005). The eight divisions contribute 6 per cent to total national poverty. Almost half of them are concentrated in only three divisions: Embakasi (19.1 per cent), Kasarani (17.3 per cent), Makadara (12.5 per cent) divisions (Central Bureau of Statistics, 2005). The poverty gap in Nairobi ranges between 11 and 24 per cent across the different divisions. Taking the district as a whole, a poor person in Nairobi would require about Kshs. 413 per month to be regarded as no longer poor. With 886,000 people living below the poverty line, an expenditure of about Kshs. 366 million per month would be needed to lift everyone above the poverty line (Central Bureau of Statistics, 2003).

3.11 LAND TENURE AND OWNERSHIP

Most land in Nairobi, including the Central Business District (CBD), is publicly owned and leased for 99 year periods to private owners (Rakodi 1997). Government leasehold covers most of the legalized residential areas, and corporate ownership of land in these areas is becoming more common. Freehold land is privately owned either by individuals or by groups of individuals and can be sold without limits to the period of ownership. This covers a small portion of land mainly to the west and north-west of Nairobi and includes suburbs such as Dagoretti, Mwimuto, Runda, Gigiri and parts of the Kahawa area in the north. Over 50 per cent of Nairobi is estimated to be under private ownership (Rakodi 1997).

By 1993, 40 per cent of Nairobi's land was owned by the Government. This included Nairobi National Park and other major parks and forest areas, airports, Kenyatta and Nairobi universities. Of the total, only about 5 per cent, mainly in the east, is owned by the City Council of Nairobi. In practice, the public sector has little direct control over land available for development (Rakodi 1997).

3.12 LAND USE PLANNING

The first comprehensive urban plan of Nairobi city was commissioned in 1926 and recommended zoning arrangements. The 1948 master plan study was the basis for the development of guidelines for residential, industrial and other public purposes for the next 20 years (Thorn white, et al 1948). Most of the current statutory planning rules and regulations originate from the 1948 master plan, while the by-laws are mainly patchworks of the various pre-1948 rules and regulations, prepared largely in conformity with the 1932 United Kingdom Town Planning Ordinance and 1932 British Planning Act (Akach 1998).

The 1948 master plan introduced the principles of neighbourhood units and is wholly responsible for the present layout of the industrial area. It also proposed important extensions to the road networks, including the relocation of the railway line and its replacement with the present dual Uhuru Highway. It recommended the institutionalization of an autonomous town-planning department within the City Council of Nairobi (Akach 1998).

The Metropolitan Growth Strategy of 1973 for the development of Nairobi up to the year 2000 made ambitious development proposals, which have only been implemented in a piecemeal fashion over the last 30 years (Nairobi Urban Study Group 1973). The strategy aimed at maximizing land use in the CBD, utilizing existing infrastructure and public services, harmonizing the then prevailing haphazard zoning system, creating a balanced urban environment and creating incentives for development and redevelopment of derelict areas in the CBD. The 1979 rezoning strategy was prepared as a land use rationalization and rezoning strategy for the CBD up to the year 2000. In 1995, the City Council of Nairobi, in consultation with the Ministry of Lands, approved a re-planning and rezoning policy for the Upper Hill and Kilimani areas. This land-use policy designated and expanded commercial centres in the Upper Hill, Hurlingham, Yaya, Valley Arcade and Lavington shopping areas. It further outlined policy guidelines on granting change-of-use permission to residential hotels and professional offices integrated with the principal residential developments. This predominantly affected residential

properties situated in development zones 3, 4 and 5 (comprising Upper Parklands/Highridge, Kilimani/ Thompson, Lower Parklands, Lavington, Benard, Loresho, and Kyuna residential areas). The foregoing had been preceded by the Westlands and Museum Hill rezoning policy approved in May 1988 to extend Westlands commercial centre. The strategy allowed for higher densities and greater vertical development (taller buildings) within the centre and its peripheries. No attempt has yet been made to re-examine, evaluate or improve the urban infrastructure services and utilities.

3.13 LAND USE

Urban land use refers to spatial distribution of social and economic activities. Accordingly, an up-to-date land use inventory is frequently required to facilitate urban planning and growth patterns as well as monitoring of urban expansion. A study by the Department of Resource Surveys and Remote Sensing (DRSRS 1994) identified eight major land-use classes in Nairobi. Each of these is discussed in the sections that follow.

3.13.1 Residential use

After open land, this is the second most dominant land-use type, covering 25.2 per cent of the city area (DRSRS 1994). Of this, informal settlements housing 65 per cent of the city's population occupy just 5 per cent of the total area used for residential purposes (Practical Action 2005).

3.13.2 Industrial, commercial and service centres

a) Commercial land use

In 1948 commercial land use covered about 2.01 per cent of the city's land area, but fell to 0.4 per cent in 1994. The city's commercial hub, the CBD, has been declining as secondary commercial centres have been growing (Thorn white et al 1948). Currently, the main CBD has extended to Westlands, Capitol Hill and Ngara areas. Other commercial centres are situated at Eastleigh, Eastlands, Buru Buru, Kayole, Karen, Dagoretti Corner, Kawangware and Kangemi.

b) Industrial land use

The city's area used for industrial purposes has grown phenomenally in real terms, but has decreased slightly in relative terms. Industrial use entails both heavy manufacturing as well as light industries such as warehouses, workshops, "jua kali" workshops, garages and stores. Since the 1970s, the industrial area has expanded to Dandora, Kariobangi, off Mombasa Road and

Outer Ring road. Some of these extensions have been uncoordinated, leading to incompatible mixed land uses that have merged with or encroached into residential use. Industrial developments and activities are regulated by several laws, including the Public Health Act, the Factories and Other Places of Work Act and the Environmental Management and Coordination Act. Enforcement of these legal instruments has been inadequate resulting in poor sanitation and environmental conditions.

3.13.3 Recreational Areas

In the 1990s large areas of public recreational land were indiscriminately grabbed by politically well-connected individuals and private developers. The hitherto elaborately planned open spaces have been built up and currently the city lacks recreational open spaces. This has significantly lowered the city's environmental quality and aesthetic value. The aim of protecting open spaces is to meet the recreational and social needs of urban dwellers; to provide facilities for outdoor passive and active recreation; to enhance the aesthetic value of urban areas and improve quality of life; and to enhance the environmental qualities of the urban landscape.

3.13.4 Water Bodies and Riverine Areas

Water bodies and riverine areas cover 1.69 per cent of the city's land area. Increasingly, pollution from municipal, industrial, mining and agricultural sources continues undermining water supplies, causing water-borne diseases and exacerbating the incidence of poverty and social inequality.

3.13.5 Urban Agriculture

About 13.9 per cent of land in Nairobi is under urban agriculture. By the late 1990s about 150,000 households were involved in urban farming (Foeken and Mwangi 1998). It is steadily becoming an alternative livelihood in the city. The benefits of urban agriculture include food security, use of underutilized urban resources, use of urban waste and income-generation. Urban agriculture has been linked to the improved nutritional status of households (UN-Habitat 2001). In Nairobi, farming takes place in backyards, along roadsides, rivers and railways, and in parks and industrial areas (Foeken and Mwangi 1998). It is estimated that crops worth over \$3.2 million are produced in the city annually from irrigated urban agriculture (Ayaga *et al.* 2004). Women play a vital role in urban agriculture, many of whom engage in cultivation as a survival strategy. Currently, urban agriculture does not feature in the comprehensive urban development

plan. And although most assume it is illegal, a close look at the Land Government and Public Health Acts and the Nairobi By-laws indicates that urban farming may be practised under certain restrictions (Ayaga *et al.* 2004).

3.13.6 Protected Areas

The protected areas in Nairobi include the Nairobi National Park, City Park and four forest reserves: Karura, Ngong, Ololua and the Arboretum.

3.14 HUMAN SETTLEMENTS

In 1948, about 51.95 km² (58.43 per cent) of the city's area was covered with residential areas ranging from very low to very high density. In 1979 residential land use had increased to 217.6 km², constituting about 31.81 per cent of the city's 684 km², but by 1994 the planned residential land area decreased to about 175.6 km² out of 696.27 km², covering approximately 25.22 per cent of the city. This was due to the re-zoning of various residential neighbourhoods to commercial and other institutional uses, particularly around Capitol Hill and Kilimani areas, Ngara, Forest road, Westlands and Parklands areas. The existing environmental problems in human settlements are the result of current urban policies. These problems are exacerbated by locating settlements on fragile land, inadequate infrastructure and services provision such as solid waste management, water supply and sanitation, and inadequate development control.

3.15 TRENDS IN HOUSING DEVELOPMENT

Housing constitutes a major dilemma for Nairobi. The housing deficit has resulted in the proliferation of informal settlements, construction of unauthorized extensions in existing estates, poor standards of construction of housing units and increasing conflicts between tenants and landlords, especially in low income housing estates and informal settlements. Housing development problems in Nairobi are the result of high rates of urban growth, lagging development of the urban infrastructure that supports housing development, the low purchasing power of the majority of urban households, and restrictive building by laws. There is also a limited supply of serviced land for public purposes and restrictions on access to formal housing finance, because of the strict lending criteria of financial institutions.

The current urban housing needs are estimated at about 150,000 per year, but only 30,000 are being built, resulting in an annual shortfall of over 120,000 units (Kusinyi 2004). The response by the public sector in building houses has not kept pace with the increase in population, leading

to a shortage of affordable housing. Public investment in housing development has dwindled, owing to inadequate budgetary provision and the emerging economic trend towards increasing private sector involvement in various sectors. For instance, approved government expenditure on housing decreased by 10.2 per cent from Kshs. 542.64 million in 2004/05 to Kshs. 487.19 million in 2005/06 (Central Bureau of Statistics 2006). This has exposed the sector to market forces which are not sensitive to the needs of the middle and low-income population, hence the continued mushrooming of informal settlements and haphazard extension of housing developments. Such housing extension has been witnessed in various estates, such as Buru Buru and Ngumo. In addition, single family dwellings have been converted to multi-family dwellings in estates in the Kilimani, Kileleshwa and Lavington areas in contravention of the permitted zone classification requirements.

3.16 INFORMAL SETTLEMENTS

Informal settlements in Nairobi have grown gradually since 1902, when Nairobi was officially founded. When European settlers appropriated large tracts of land in Kiambu, Limuru, Mbagathi, Ruiru and other areas, many people were displaced. The colonialists made little provision for accommodation for the Africans and this led to the emergence of squatter settlements (Rakodi 1997). With independence, the Africanization policy led to even more people coming to the city. Consequently, temporary dwellings began to spring up. The Kenyatta administration allowed migrants who could not find accommodation in the formal low-cost estates like Kariokor, Bahati and others to put up shacks within the city, as long as these were not too close to the CBD. (Shihembesta, 1989)

Some of the drivers leading to the development of informal settlements include rapid increase in urban population, high cost of land and land speculation, inadequate housing, lack of proper forward planning preceding actual development, declining modern sector employment and urban poverty among others.

By 1993, about 55 per cent of the city's population was living in unplanned settlements (Matrix Development Consultants, 1993). These settlements are variously called squatter settlements, unauthorized subdivisions, substandard inner-city housing, custom-built slums, and boarding houses (World Bank 2000). Between 1971 and 1995 the number of informal settlements within Nairobi rose from 50 to 133, while the estimated total population of these settlements increased from 167,000 to 1,886,000. (UN-Habitat, 2003)

Most informal settlements are found in Dagoretti, Lang'ata, Kasarani, and Makadara divisions (Rakodi 1997). There is great disparity, however, in the spatial occurrence and size of the informal settlements. For instance, Kibera (Lang'ata division) and Kawangware (Dagoretti division) cover areas of 225.6 and 111 ha respectively; while others like Spring Valley (Parklands division) and Mitumba (Lang'ata division) cover areas of just 1.29 and 1.5 ha respectively. (Matrix Development Consultants, 1993)

3.17 ENERGY

The factors determining choice of energy use depend on its relative price and the appliances that it will use; income levels; the availability of the fuel and related appliances in the market; and cultural preferences. Baseline surveys reveal that Nairobi consumes approximately 91,250 tons of charcoal annually, equivalent to the destruction of over 900,000 tons of green wood each year (Barnett and Ndanyi 2003). Data show that 71.4 per cent of Nairobi households have electricity (Central Bureau of Statistics et al. 2004). For cooking, however, 68.3 per cent of households use kerosene, 19.8 per cent liquid petroleum gas (LPG), 7.4 per cent charcoal and only 1.8 per cent electricity (Central Bureau of Statistics et al. 2004). Renewable energy used includes solar, wind and hydropower. Other energy sources commonly used include power alcohol, biogas and municipal solid waste. Human power is used to drive the handcarts known as "*mkokoteni*". The Local Government Act requires the licensing of handcarts used in urban areas. Dry cells and vehicle batteries are also used at the household level as a source of energy, in flashlights, radios, television sets and clocks. Choice of energy source is dictated by its relative price and the appliances to be used; income levels; the availability of the fuel and related appliances in the market; and cultural preferences.

3.18 MOBILITY AND TRANSPORT

Nairobi acts as the central point where journeys begin to destinations all round the country and is itself the country's primary destination. Transport in Nairobi can be divided into five categories: private vehicles, buses, *matatus* (minibuses), commuter trains and taxis. Sometimes ignored, but equally important are the non-motorized forms of transport, such as walking and cycling. Dealing with urban mobility issues is an economic, social and environmental priority. The city's traffic jams, pollution and inadequate pedestrian facilities and cycle lanes represent a major setback to the productive capacity of the economy, affecting all segments of society.

3.18.1 Non-motorised transport

Walking was particularly popularized by the establishment of the “landhies” (barrack-like accommodation initially built for the railway track maintenance staff during the colonial period) that were established close to key suburbs and the CBD, so that workers would not have too far to walk to work. Even today most of the low-income segment of the population walks to work every day, covering distances of 7–15 km. This is because of the inadequacy of public transport, the unavailability of alternative forms of transport such as bicycles, and the fact that they cannot afford the daily bus-fare.

3.18.2 Motorised transport

Private vehicles are mainly used by the middle and upper income groups, owing to the high cost of purchase and maintenance. City officials estimate that the number of private cars registered in Nairobi has tripled in the past five years to nearly 1 million. (Ryu 2005) Mass transportation is provided by trains, buses and matatus. It is estimated that the Kenya Bus Service and *matatus* make a total of one million trips per day. (Bultynck 2001) Overall, more than 500,000 vehicles drive in and out of Nairobi every day (NMS 2006).

3.19 ROADS INFRASTRUCTURE

The transport sector is an important pillar of the economic growth and development of Kenya. A sound transport network enables efficient movement of people, goods and services and facilitates trade between different regions. In Kenya, road transport is the lifeline of the nation's development, since 80 per cent of the commercial freight transport relies on roads. Furthermore, good roads are essential for the development of commerce, tourism and other services (Kibaki 2004).

Nairobi's transport infrastructure is ill-equipped to handle the additional travel generated mainly by the increasing population, and other service activities in the CBD and industrial area. Inventories in 1992 and 1998 found that there are 300kms of main roads and 850kms of access roads, including unpaved earth tracks, much in deteriorated condition (Kenya Roads Board 2003). Only 39 per cent of the network surfaces were in good or adequate condition, the remainder being poor or very poor requiring resurfacing or reconstruction. Drainage conditions were worse with 56 per cent poor (under design) or very poor (non functional) and 17 per cent having no roadside drains or culverts. Often, some areas planned for infrastructure are

encroached upon by informal settlements and business activities. The poor state of the roads is often compounded by the amount of traffic on them.

3.20 WATER SUPPLY AND SANITATION

3.20.1 Access to safe water

Despite the fact that production exceeds demand, only about 187,000 (or 42 per cent) of households in Nairobi have proper water connections (Ministry of Water & Irrigation 2005). The poor state of the distribution system results in up to 50 per cent losses due to leakages and illegal connections (UNEP undated). The urban poor and slum dwellers are the ones who suffer most from the lack of piped water supply. They obtain water from water vendors, by making illegal connections or directly from the water bodies. Water vendors charge much more than the tariff paid by those who are directly connected to the Nairobi water supply. In times of drought, or when city water supply is diverted elsewhere, this price is driven even higher. Lack of access to water forces these communities to spend a large proportion of their income on water leading to household poverty.

3.20.2 Sanitation facilities

The Kenya 1999 population and housing census showed access to sanitation facilities to be at the level of 95.2 per cent in Nairobi, compared to 83.2 per cent for the country as a whole. The Ministry of Health does not consider pit latrines (on-site sanitation) in urban areas as adequate, so this brings the figure for adequate sanitation coverage within Nairobi to only 66.5 per cent. (Central Bureau of Statistics 2002)

Sanitation in the informal settlements is very basic. It mostly consists of earth drains, communal water points, no solid waste disposal systems and pit latrines each shared by as many as 60 people (Practical Action, 2005). The situation is perpetuated by the illegal status of the settlements. Because they are not officially recognized by the Government, the City Council of Nairobi has no mandate to supply piped water or sanitation services. This has a negative impact on the environmental health of these slum dwellers. There is a high incidence of diseases such as typhoid, diarrhoea, amoebic dysentery and others.

3.20.3 Sewerage systems

Approximately 48 per cent of Nairobi's population is served by the existing sewerage system (Republic of Kenya, 2002). This system suffers from a number of problems, including poor maintenance, illegal connections, use of toilets for the disposal of garbage, and deliberate blocking of sewage pipes for irrigation (Scott *et al.* 2004). If properly implemented, there are opportunities for the use of wastewater in urban agriculture. Research in 2000 indicated that 3,700 farmers in Nairobi practise irrigation and that of these 36 per cent use wastewater (Ayaga *et al.* 2004).

Sewerage management problems are compounded by densities in some housing areas that are higher than those for which the sewerage system was originally planned, and the location of some informal housing in areas unsuitable for residential use. Existing treatment plants do not have the capacity to deal with the quantities of sewage produced. This results in the disposal of untreated sewage into water bodies in the city, posing a health hazard to residents. Indeed in all three rivers running through Nairobi, total coliform counts increase downstream and no dilution effects seems to take place, implying that there are human wastes or other sewage discharge points along the rivers (University of Nairobi/UNEP 2005).

3.21 INFORMATION COMMUNICATION TECHNOLOGY (ICT) AND TELECOMMUNICATIONS

Fixed-line telephony service is provided by Telkom Kenya Ltd. The regional fixed line distribution is more or less concentrated in Nairobi with 56 per cent of the country's total subscribers situated in the city, while the remaining 44 per cent are distributed across other regions of the country (Communication Commission of Kenya, 2004). At the national level, fixed-line telephone coverage is 0.90 per cent. Nairobi has 7.42 per cent, compared to Mombasa at 1.43 per cent and the other regions that are in the range of 0.5 per cent and below (Mitullah and Waema 2005).

Mobile phone services in Kenya started in 1992 and there are currently many service providers, mobile telephone coverage in Kenya is 12.42 per cent respectively. Kenya has 72 licensed internet service providers (ISPs), but, only about 14 are operating (Mitullah and Waema 2005). Most ISPs offer a range of services; including dial-up and leased line services charged mainly at a flat rate. Most facilities are located in Nairobi. Postal services are provided by the Posta Corporation of Kenya. Its operations are guided by a strategic plan that spells out measures to be

undertaken in response to the challenges posed by economic liberalisation and technological advances in the way people communicate today.

The 2006 national ICT policy seeks to facilitate sustained economic growth and poverty reduction; promote social justice and equity; mainstream gender in national development; empower young people and disadvantaged groups; stimulate investment and innovation in ICT; and achieve universal access.

3.22 POLLUTION AND WASTE MANAGEMENT

Water, air and land in Nairobi receive large quantities of pollutants with significant deleterious effect on their quality and on the quality of life in general. While the problems of water pollution in the city and inadequate municipal solid waste management are not visible to the naked eye, air pollution is not. The rapid growth of the number of vehicles and of commercial and industrial enterprises is generating enormous amounts of air pollutants.

3.22.1 Water pollution

Several factors are involved in compromising the quality of water in the city. These range from natural phenomena such as the high fluoride content in groundwater, to anthropogenic factors such as poor waste water treatment and environmental degradation, both within the city and in the surrounding countryside.

The inadequacy of waste water management capacity in the city represents one of the serious sources of water pollution for Nairobi River and its tributaries. A study by Gath Engineers consortium in 1991 shows that untreated effluents mainly emanate from industries, open drainage from carwash activities, raw sewage from residential premises and hostels, discharge from burst sewers, oil from petrol stations and oil-manufacturing industries, among others.

3.22.2 Air pollution

Air pollution is mainly the result of anthropogenic activities. The main sources of atmospheric pollution are vehicles, industries, emissions from the use of charcoal and firewood for energy, and other municipal sources such as the open burning of waste. Air pollution adversely affects human health, properties and the environment. In particular, air pollution is associated with respiratory and eye diseases such as asthma, lung cancer and conjunctivitis, especially in the young and elderly (UNEP/WHO 1992; Patel 1994). Air pollution is a major contributor to effects such as acid rain, which has been responsible for much damage to soil, fish resources and

vegetation, often very far from the source of the pollutant. The main sources of atmospheric pollution are vehicles, industries, emissions from the use of charcoal and firewood for energy, and other municipal sources such as the open burning of waste.

3.22.3 Waste collection and disposal

Only about 40 per cent of the waste generated in Nairobi is collected by the City Council of Nairobi, the private sector collects about 20 per cent and the balance is left uncollected, or is disposed of through other means, including by burning, dumping in pits and other unauthorised places, or is collected by the numerous non-governmental organizations, community-based groups and other ad hoc or voluntary groups (Ikiara 2006).

It is estimated that there are at least 60 private companies engaged in solid waste collection services in the city (JICA 1998 in UNEP/NEMA 2005). According to the City Council of Nairobi, at the beginning of 2007, this number had increased to about 85. Some of these companies also operate as waste recovery and composting groups and therefore improve on the cleanliness of the surrounding environment (Ikiara 2006). Mixed waste from industry is disposed of by the industries themselves at Dandora for land filling.

Nairobi has one official disposal site (City Council-owned and operated) situated in Dandora, Eastlands, about 7.5 km from the city centre, where about 30 per cent of the waste (excluding hospital waste) collected is taken. The disposal site has been in use since 1981 and has accumulated close to 1.4 million cubic metres of waste. As a result of poor management, the disposal site is perceived to be full and the City Council of Nairobi has no waste transfer facilities (UNEP/NEMA 2005). This poses particular threats, including potential pollution of water sources by landfill leachates and the migration of explosive gases.

3.23 CLIMATE CHANGE

The impacts of climate change, in the form of droughts and floods, are already being felt in Nairobi, especially in the informal settlements, where coping mechanisms and adaptation strategies are weak. Rural-urban migration and poverty has led to houses being built in inappropriate places and poor disposal of waste into drainage channels and streams. This is compounded by weak enforcement of building regulations and local development plans by City Council of Nairobi to prevent building in flood hazard zones in the city (Action Aid 2006).

The increased incidence of flooding appears to have links both to local activities and to global climate change. Indeed, research has shown that in slums like Mbatini in Mathare floods now

occur in places they did not two decades ago (Action Aid 2006). Floods have been known to lead to human deaths and disrupt traffic flow within the city.

Other extreme climate events such as drought have also hit the city, increasing the vulnerability of the local population. For instance, the 1999–2000 droughts led to serious power and water rationing and an influx of pastoralists and their livestock in Nairobi. At that time, herds of livestock were a common sight in some areas of the city such as Embakasi (UNEP/DRSRS undated). The volume of water in urban water supply dams decreased drastically in tandem with the decreased river flows at the height of the drought. Water supply to Nairobi then only measured 274,900 m³ per day, way below the normal demand of almost 350,000 m³ per day (UNEP/ DRSRS undated). This resulted in water rationing and the mushrooming of water vendors, whose water was at times of questionable quality.

More recently in late 2006, heavy rains led to the deaths and displacement of people living along the banks of the Ngong and Nairobi rivers. The City Council of Nairobi does not seem to have any specific mechanism or action plan for reducing disaster risk or managing disasters once they happen. For instance in the case of floods, once they happen, poor people are left to fend for themselves with whatever individual coping strategies they can muster (Action Aid 2006).

CHAPTER FOUR-THE STUDY AREA: KILELESHWA

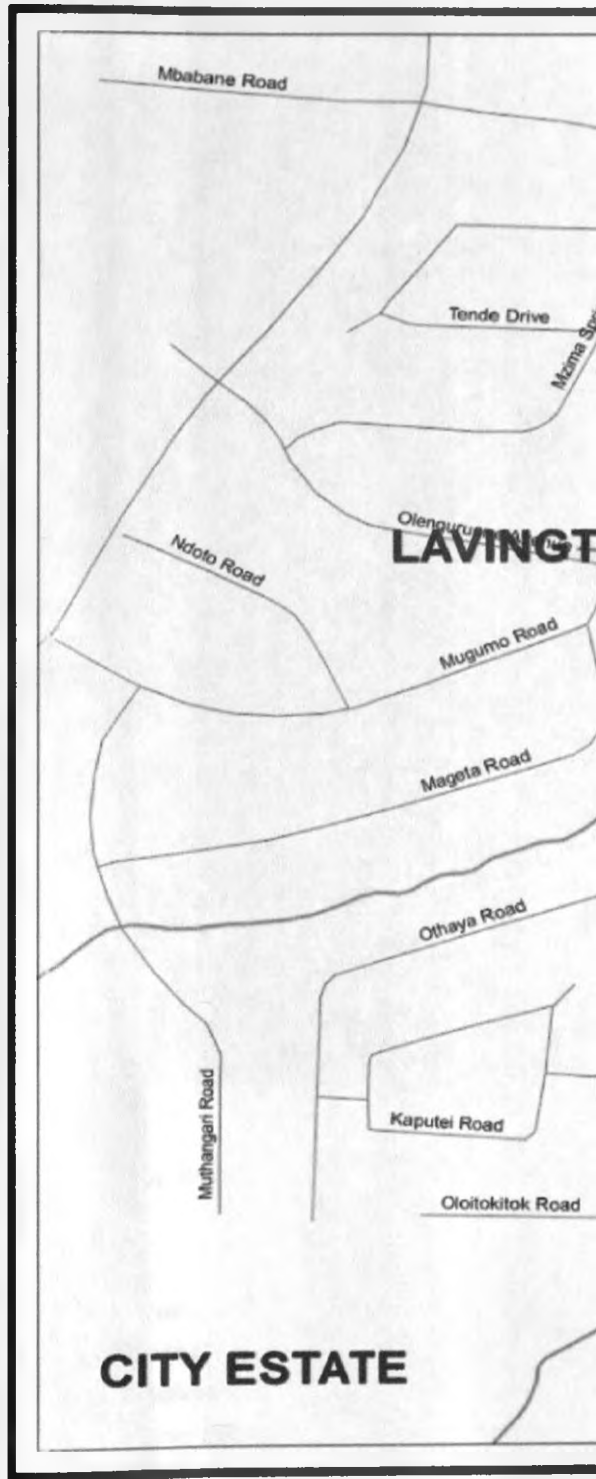
4.0 INTRODUCTION

This chapter discusses the various attributes directly related to the Kileleshwa estate, it is envisaged to provide an understanding of the natural and man-made features that have contributed to shaping the character of Kileleshwa estate as it is today in light of development policies that have targeted the estate. It is also assumed that understanding the various attributes of Kileleshwa estate will guide the process of searching for the appropriate interventions.

4.1 LOCATION OF KILELESHWA

Kileleshwa is located in zone 4 of the city's planning zones. The estate is located approximately six kilometres west of the CBD. The area extents are defined by the Kirichwa Kubwa River and Kirichwa Ndogo River; mainly accessed through Ring road Kileleshwa, Manderu road, Gatundu road, Nyeri road and Othaya road as one travels from the CBD through Arboretum towards City estate. Map 4-1 below shows the regional location of the Kileleshwa estate, while Map 4-2 shows a Satellite image of the same area i.e. Kileleshwa estate.

Map 4-1: Regional context of Kil



Source: Adapted from the Survey of Kenya

Map 4-2: Satellite image of



Source: Adapted from the Regional

4.2 HISTORICAL BACKGROUND OF KILELESHWA ESTATE

The Nairobi Master Plan of 1948, neither altered the municipal boundary, nor the overall disposition of the zones established within it, thus it endorsed the development of Nairobi as a colonial capital. Consequently, what were described in the plan as residential zones indicated areas of Europeans and Asian housing, while housing for Africans were situated next to the area designated for industrial expansion.

During the next 15 years, Nairobi developed more or less along the lines prescribed by the master plan, but unemployment opportunities which were expected in the city as a result of independence in 1963, raised the population to 266,800 already more than the planners target by the year 1975. Expansions of the city of Nairobi was expected to take place partly within the built up areas, where 50 per cent remained undeveloped, but mainly on 20 square miles of black-cotton soil and ranching land to the East of Nairobi.

The growth of the city continued along the racial segregation and was only replaced by social segregation after independence in 1963. As such, residential neighbourhoods which were European and Asiatic based, have since attracted the African social high class. Therefore, up to early 1980s the Kileleshwa estate was fully residential with predominantly maisonettes and bungalows siting on half acre plots, fully serviced with water, sewer, electricity and tarmac roads.

However, in the 1990s the area was densified leading to maximization of land use as opposed to the earlier residential maisonettes and bungalows sitting on half acre plots. Before independence the entire area was owned by non-Africans, presently there is mixed ownership as occasioned by the 1993/1996 development policy. The neighbourhood is currently presenting a diversity of buildings, the traditional maisonettes and bungalows sitting on half acre plots have been replaced with high rise apartments and mixed development typology.

4.3 PHYSIOGRAPHICAL BACKGROUND OF THE STUDY AREA

4.3.1 Topography

Kileleshwa estate lies at the edge of the Great Rift Valley to the west with an elevation of 2,300 meters to 1,500 meters above sea level with the centre being 1,700 meters above sea level. Its geology and topography have been greatly influenced by tectonic forces due to formation of the Great Rift Valley.

4.3.2 Geology

The geological history of Kileleshwa estate is dominated by widespread volcanic activity which exerts a controlling influence on its land forms, drainage pattern and climate. Tertiary lavas, welded turfs and overly poorly exposed folded and faulted metamorphic rocks, gneisses and schist of Precambrian era. Its environs lies within the seismic intensity zone of between 6 to 7 on the Richter's scale and is prone to moderate seismic risks with occasional shocks and tremors. Therefore the area requires consideration of seismic risks and effects on the design of structures. Damages to structures located in the fault zones can be high where land use is intensive.

4.3.3 Hydrology

The hydrology of Kileleshwa estate is controlled by the nature and morphological set up of the various volcanic lava flows and the configuration of the old land surface of the basement rock system. The river drainage system and ground water table gradient closely follows the easterly direction of the lava flows. Aquifers occur within the Kirichwa valley tuffs and sediments in the interface between Nairobi phenolite and Kapiti phenolite of the Athi series of tuffs and lake settlements.

4.3.4 Soils

Kileleshwa estate consists of well drained red volcanic coffee soils and loamy soils underlain by Kirichwa valley tuffs, below which lies the Nairobi stone. Both the soils and geology have good load bearing capacities and can adequately support the varied developments. The red coffee soil is a residual soil formed in regions where drainage conditions are generally good and the red colouration is due to staining by iron oxide. Residual soil may occur as laterites and when rain water leaches out the soluble rock materials it produces chocolate coloured soils or whitish sandy soils. The red soils are generally compressive and have low moisture content. These soils are generally cohesive with high coefficient of permeability. Along the river courses and stream valleys poorly drained swampy peat soils occur and display deep grey coloured organic layers.

4.3.5 Drainage

The Kileleshwa estate is sandwiched between the Kirichwa Kubwa and Kirichwa Ndogo rivers, the area between the two rivers is relatively high and slopes to either sides following the valleys created by the two rivers. The area has a natural drainage pattern that prevents the Kileleshwa estate from being prone to flooding and this pattern has made the construction of storm water drainages easier throughout the estate.

4.3.6 Vegetation

The existing vegetation in Kileleshwa exhibits a rich variety. There are many mature trees including: jacaranda (*jacaranda minosofalia*), Grevillea (*Brachylaena unilenis*), Acacia ssp. (*Acrocarpus fraxinifolius*), Indian ash. Albazia ssp., candle nut tree (*Aleuvittes moluccana*), Araucaria bidwili (*Bunya Bunya pine*), Araucaria columnaris, Araucaria cunninghamania, Neem trees (*Azasdirachta*), Bush tuc (*calli stemon*), casuarinas ssp., Groton megalocarpus, and c. macrosta-chirus, cypress, plums, Eucalyptus, ficus benjamina, junipers procera, among others.

This is indeed a rich variety of trees providing a beautiful scenery, fresh air and shade. A variety of grasses also exist. Although many of these trees appear mature and in some cases old, the proposed neighbourhood growth model takes cognisance of their existence and attempts to preserve as many of them as possible particularly those along plot boundaries and in the existing and proposed open spaces.

4.4 PHYSICAL INFRASTRUCTURE

The development of infrastructure and provision of services are necessary programmes for growth, improvement of livelihoods and national development within the urban population. Although such programmes do not directly contribute to economic production, their indirect contribution is crucial in sustaining the production process. While there is no consensus on the precise impact on infrastructure in growth, many studies in the issue have concluded that this is substantial and often greater than the contribution of investment in other form of capital (World Bank, 1994).

4.4.1 Sewer system

The plans to construct a sewer line system in Kileleshwa estate were conceived in the early 1970s. Sewer reticulation plans were prepared by the City Council of Nairobi Water and Sewage department and were completed in 1975 for Kileleshwa and Hill areas. The sewer project was planned partly by the CNN and the European Economic Community (EEC).

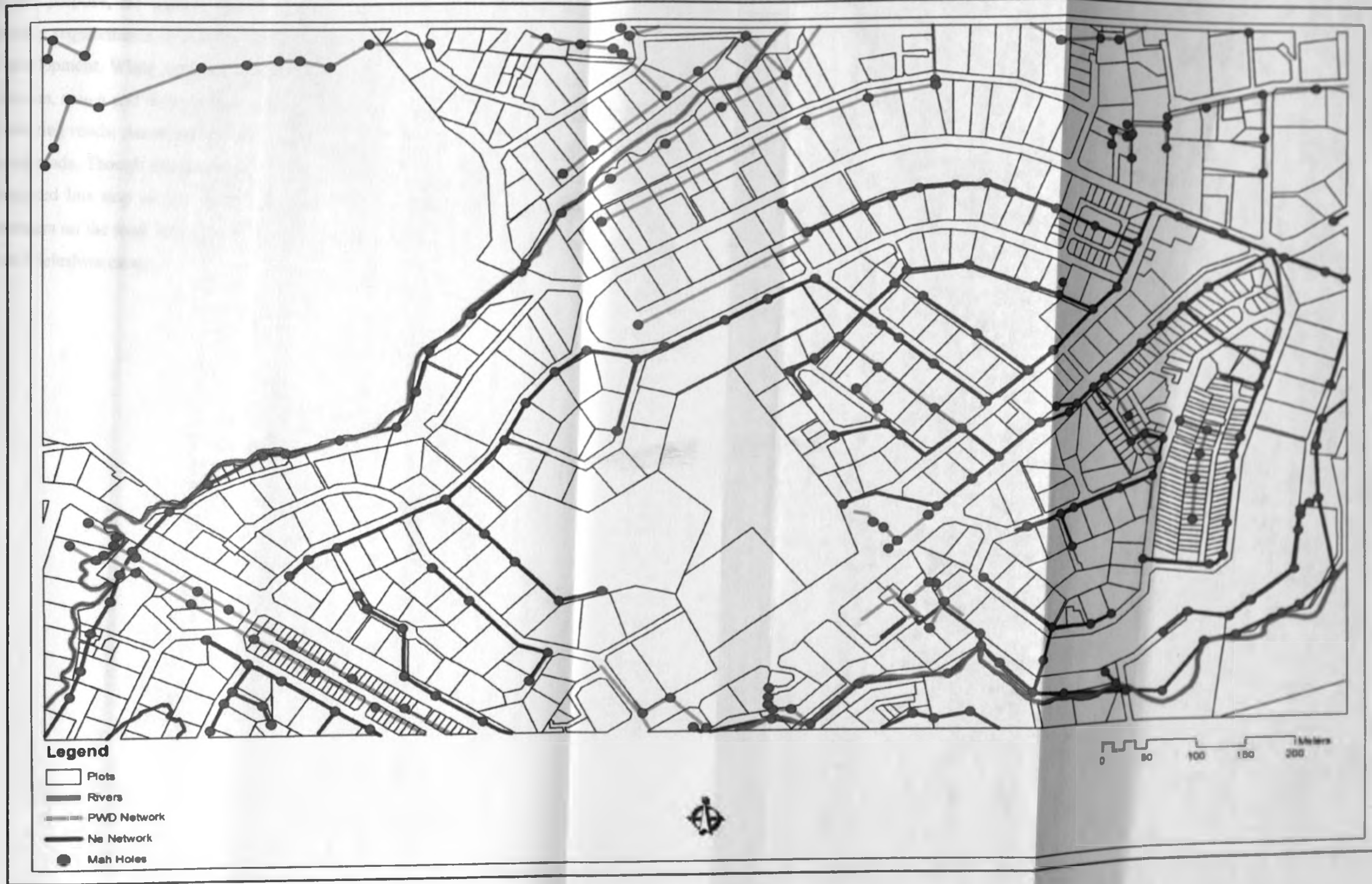
The final apportionments chargeable to plot owners were approved by the city commission in January 1986 while the initial provisional apportionment was approved in October 1977. Since the last sewer project, there has never been additional upgrading despite the sewer system continuing to serve an ever increasing capacity which was not anticipated in the design. This poses a major challenge as regards sustainability of the sewer system.

4.4.2 Water supply

Kileleshwa estate is connected to the Nairobi Water & Sewerage Company (NW&SC) water mains. Where new sub-division schemes have been carried out, the new sub-plots are connected with water after relevant applications are lodged by the developers and after relevant fees are paid for connection to the mains or extension of water pipes from the existing mains. The population pressure currently being experienced in the city has led to water rationing especially in the low income residential zones. Kileleshwa estate occasionally experiences the water shortages though at a minimal scale. The NW&SC has attempted to address the increasing demand by constructing extra dams with donor support to reduce the water shortages in the city. Map 4-3 below shows the water, sewer and drainage networks within Kileleshwa estate.



Map 4-3: Water, Sewer and Drainage networks within Kileleshwa



Source: Adapted from the Survey of Kenya, 2010

4.4.3 Roads

Roads within the study area were designed to serve low density development. While this is adequate for this purpose, the same is not true if they are to serve an increased traffic flow, additional parking requirements in areas with increased apartment construction and any future commercial development. While most of the access roads are tarmac roads, a number of roads are mainly murrum, rough and dusty with no specific carriage way. There are also a number of under developed ring roads. An indication that there is need for widening and opening up of the under developed roads. Though the area is served by public transport vehicles (*matatus*) there is only one designated bus stop in the whole Kileleshwa estate leading to *matatus* picking and dropping passengers on the road thus contributing to congestion. Map 4-4 below shows the road network within Kileleshwa estate.

Map 4-4: Road network v



Source: Adapted from the Survey

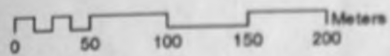


Plate 4-1: A tarmac road within Kileleshwa estate



Source: Field Survey 2010

Plate 4-2: A murram, rough and dusty road within Kileleshwa estate



Source: Field Survey 2010

4.4.4 Commercial centres

The main designated shopping centre in the study area is the Kasuku centre, located along the Kasuku road and Mandera road junction, but due to many other factors many other informal shopping centres and street vendors have sprung up at various points within the estate. During the field survey it was observed that there were; 6 informal business centres, street vendors at 7 different points ranging from vending fruits and vegetables to shoe and bicycle repair, 6 kiosks on perimeter walls. There is also exists a Shell petrol station and a hotel (NIBS Hotel) within the Kileleshwa estate.

Plate 4-3: An informal business centre within Kileleshwa



Source: Field Survey 2010

4.4.5 Institutions

There are within the Kileleshwa estate the following institutions: security, educational, medical, religious, political, research and financial institutions both presenting various interests as exemplified in table 4-1 below.

Table 4-1: Categories of institutions in Kileleshwa

Category	Public	Private
Security	Kileleshwa Police Station	
Educational	Kileleshwa Primary School, Kileleshwa Nursery School	Kensington kindergarten, Goodrich Kindergarten, Seedlings Kindergarten, Jabali Kindergarten, Kenton Preparatory & Primary School, Jacaranda Special School, International Hotel & Tourism Institute, Crossway Psychological & Psychometric Institute
Medical		Swedish medical Clinic, German Medical Centre, Othaya Road Gertrude's Clinic
Religious	Holy Trinity catholic Church, Kileleshwa Convent Community Church	Solar cooker International
Political		National Rainbow Coalition, ODM-Kenya
Financial		Educational Finance Trust International
Research		Centre for Law & Research International (CLARION)
Other		Solar Cooker International

Source: Field Survey, 2010

Plate 4-4: A religious institution within Kileleshwa



Source: Field Survey 2010

4.5 PLANNING POLICIES

The urban planning system and procedures have been top-down sector based, a process that has created deficiencies in urban development and management. As a result, services have been provided without proper plans necessitating *ad hoc* provision of services consequently increasing the cost of supply of the services per area and per capita respectively (Attahi 1992:116, Bartley 1993:87). Further, costly investments in the city services especially basic infrastructure such as roads, drainage and water supply have been wasted for lack of maintenance.

The Local government Act (Cap 268), Physical planning Act (Cap 286), The Public health Act (Cap 242), the Registered land Act (Cap 281), World Bank II standards and other measures are used to control developments such as planning regulations and policies among others. In reality these instruments have not been strictly adhered to due to inadequacy in skilled personnel. This has rendered the rate of identification of unauthorized users in Kileleshwa too low and often too late as compounded by poor vigilance on illegal developments. There are also some of the

clauses in the guidelines and regulations raising conflicts due to the absence of effective co-ordination and interpretation.

The most critical problem of development in the city is land speculation whose origins dates back to the colonial notion of no man's land which the colonialists used to acquire large tracts of land as either private property or as leases extending to 99 years without regards to the community needs and aspirations. (*Banyikwa, 1988, Obudho, 1988:114*)

While the European zones such as Kileleshwa estate were carefully planned in conformity to accepted standards, densities and development principles, the continued densification of the estate is taking its toll on the estate, this is worsened by the rapid urbanization in the city that has exacerbated and inhibited the prospects for coordinated and managed growth.

4.6 NEW DEVELOPMENTS

Originally the Kileleshwa estate was exclusively low density residential. This scenario no longer holds; the sub-division of plots into smaller units and development of flats has increased the housing population density to medium-high density. Although some of the old type bungalows that characterised the estate some years back still remain, it only a matter of time before they are out bid by high-rise residential developments. During the field survey the study identified 15 sites with high rise residential developments under construction, oblivious to the likely impacts of these developments on an already overwhelmed infrastructure.

Plate 4-5: Apartments under construction within Kileleshwa



Source: Field Survey 2010

4.7 DEVELOPMENT CONTROL

The most notable feature of the absence of an effective development control mechanism by any local authority including the CCN is the lack of adherence to the maximum floor limit. The maximum floor limit for the Kileleshwa estate is four floors; yet there are some developments that have not fulfilled this condition and no effective corrective measure seems to be taking effect. Below is a picture of such a development.

Plate 4-6: A building that exceeded the required floor limit



Source: Field Survey 2010

CHAPTER FIVE-EMERGING ISSUES FROM THE 2006/2007 POLICY REVIEW

5.0 INTRODUCTION

This section analyses the outcomes of the 2005/2006 policy review and recommendations with the view of bringing to focus the challenges, tentative solutions to existing challenges and other pertinent issues that the policy addressed or failed to address either by default or by design.

5.1 FINDINGS OF THE POLICY REVIEW

- a) Densification of development had led to challenges such as the loss of vegetation cover, encroachment on riparian reserves, the altering, interference and pollution of river courses and increased surface run-off.
- b) The zones' high value properties were inhabited by predominantly high income groups with pockets of middle and low income groups, this resulted to social disharmony due to disparities in income and reduced social interaction as result of erecting barriers such as gates to homes.
- c) The emergence of new commercial nodes equally presented opportunities for the growth of sub-centres which were envisaged to relieve pressure on the main Central Business District (CBD).
- d) The zones were experiencing challenges ranging from over densification of building developments which were not adequately supported by infrastructure and services.
- e) The emergence of ribbon developments along primary and secondary streets was leading to proliferation of business centres and informal economic activities beyond areas that had been designated as commercial zones.
- f) The incompatibility of mixed-use developments within homogenous residential neighbourhoods resulted to loss of privacy.
- g) The increased over densification occurring was found to be flouting the zoning policy and building development control regulations.
- h) Emergence of informal settlements
- i) The road bearing capacity had been exceeded in most areas. There was poor design of junctions, inadequate provision of bus stages, inadequate parking, and inadequate provision of non-motorized transport infrastructure.
- j) The capacity for current levels of sewer and water had been exceeded leading to pressure during peak periods and sewer blockages and overflows.

- k) The zones were well provided with community facilities – schools, police stations, administration and health facilities – and that large parcels of land are still reserved for public utilities.
- l) There were loopholes in the enforcement of the building development control guidelines and the zonal requirements.
- m) There was disconnect between development control policies and implementation; leading to misinterpretation and flouting of the existing development policies.
- n) Zones 3, 4 and 5 development trends had resulted in both a rise in land values and a drop in property values.
- o) As a planned development area coupled by its prime location it had immensely attracted local and external funding for building developments.

5.2 RECOMMENDATIONS OF THE POLICY REVIEW

- a) Formulation of a comprehensive environmental management plan which would be geared towards addressing the conservation of the flora and the fauna by promoting greening and city beautification programmes, enforce building development control regulations and strengthen policies and the legal framework for the protection of parks and open spaces, riparian reserves, forests, road reserves, railway reserves, power line way leaves and sewer way leaves.
- b) The population was to ensure that they upheld the high values of the neighbourhood characteristics, in addition to adequate participation of residents and their neighbourhood associations in the planning, development and management of the residential neighbourhoods.
- c) The neighbourhood associations were to be strengthened, efforts were to be made to involve them in governance and equally to be provided with information on planning and development matters.
- d) Zones 3, 4 and 5 were to be developed as healthy neighbourhoods, to be scaled down to sub-zones in order to give residents a sense of place and belonging with specific values.
- e) The zones would be defined by convenient walking distance for accessing the needs of a daily life such as convenient stores, community facilities and other social amenities.
- f) Typical neighbourhoods would have a range of parks from small green lots to village greens and green belts.

- g) The neighbourhoods would be conveniently planned to be accessible to all residents and to major activity areas by different modes of travel- Motorized, walking and by bicycle.
- h) There would be increased car parking requirements from 1.5 to 2 or 3 for higher socio-economic groups.
- i) Punitive measures and radically stiff penalties would be enforced to developers, City Council of Nairobi officials and professionals for flouting building control regulations and zoning guidelines and especially those who build contrary to approved or no approval at all.
- j) The plans' approval process would be speeded up to improve on private investor confidence, adequate publicity, information and existing policy guidelines would be given to areas and plots whose user was proposed to be changed or extended.
- k) The review of policy for the zones would be a continuous process which would reflect the dynamic social, cultural, economic and political forces of urban development.
- l) A specific hierarchy of nodal developments needed to be nurtured; specific locations for corner shops and informal economic activities which would be adequately planned for in order to offer the lowest order goods.
- m) Commercial developments would be restricted to designated commercial zones or else re-plan for the rezoning of areas where pressure was insurmountable.
- n) The main satellite CBDs such as Kilimani and Westlands would be planned to provide higher order goods with commensurate support from other urban fabric to support them.
- o) The changes of user would not be approved outside the zoned commercial area.
- p) With regards to the informal settlements in the neighbourhood it was recommended that linkages be fostered between formal residential neighbourhoods and informal settlements through the development of markets such as *Toi Market*, to develop non-motorized transport routes with informal economic activities alongside them and to develop mass public transport facilities for low income people.
- q) There would be introduced ring-fenced infrastructure development fund contributed by all developers and that there be a development levy charged on improved site value to enable the City Council of Nairobi improve on service delivery.
- r) Institutionalisation of the participation of the public to create awareness and sensitization; to urban residents, developers, professionals, and local authority officials

- s) The CCN was to enforce all the legal requirements, standardise the publication procedures and harmonise the policies and regulations.
- t) Continuous research and the establishment of communication channels within and between the CCN and community
- u) Each zone equally needed to have sub-zonal plans with specific land-use plans, sub-zonal guidelines and requirements.
- v) The implement the Nairobi Transport Master Plan, to develop the missing links and link roads and to develop the proposed by-passes.
- w) The policy review proposed a policy framework for zones 3, 4 and 5 as illustrated in table 5-1 below:

Table 5-1: Proposed policy framework for zones 3, 4 and 5

Zone	Sub Zone/ covered Area	Ground Coverage %	Plot Ratio %	Min Area (Ha)	Type of Development	Remarks/ Policy issues
3	Parklands, Highridge centre	2.0	0.2	0.2	Mixed Use- commercial and residential	Mixed development, Roads widening , harmonise road widths
	1st Parklands Avenue, Parklands Road and Shivachi Road	1.0	0.2	0.2	Flat development	Maximum four floors
	Remaining Part of Parklands	1.5	0.2	0.2	Flat development	Maximum two flows
	Deep Sea,	-	16.8	16.8	Open Space/ Recreational	Area to be reclaimed from informal to public open space
4	4A-Upper Parklands,	35	0.75	0.1	No flats,	No development of flats and apartments
	Mathari River, Canalized	25	0.25	(S)	Maisonettes, Town	
	stream,	20	0.20	0.2	houses allowed on	
				(US)*	minimum 0.05ha	
			0.25	per household		
			(US)**			

	4B1-Waiyaki way, Nairobi river, Mvuli road	35	1.5	0.1	Office and residential Development	Mixed use development: residential and office allowed
	4B2-Mvuli road, Nairobi river, Mahiga Mairu, canalized stream, Ring road, Lower Kabete road, Karuna road	35	1.0	0.2 0.05	Flats Single dwelling maisonettes or town houses on 0.05 ha	-
4	4B3-Waiyaki way corridor				Office development	Conform to existing policy guidelines Maximum 4 floors
	4C-Riverside Nairobi river, Kirichwa Ndogo, Ring road Kileleshwa, and boundary of zone 4 & zone 5	35	0.75	0.4 0.05	No Flats Single dwelling maisonettes or town houses on 0.05 ha	Conform to existing policy guidelines
	4D-Kileleshwa area: Kirichwa Ndogo, Kirichwa Kubwa, Muthangari road	35	1.0	0.4 0.05	Flats Single dwelling maisonettes or town houses on 0.05 ha	Regularize the existing flats; allow 10% for greenery; expand Kasuku Centre (to cover area within Migori Road, Laikipia Road and the Ring Road)
	4E-Yaya centre-Lenana Road, Wood Avenue, Chania road, and Chaka Road	35	1.5		Commercial Development	Harmonize the width of Argwings Kodhek road from Hurlingham to Ole Odume road to 24 metres and others within the commercial area to minimum 15 metres
	4F-Denis Prtt road, Lenana road, Rose Avenue, and Ralph Bunche road	35	0.75	0.05	Single dwelling maisonettes or town houses on 0.05 ha Flats	No Flat development Maximum 4 floors for flats on at least 0.4ha
	4G-Kirichwa Kubwa river,	35	1.0	0.2	Residential Flats	Flat development; Widening of Lenana

	Gitanga road, Naivasha road, Ngong road, Valley road, Lenana road, and Rose avenue					road to 18 metres
	4H-Woodley Area - Ngong road, Impala club, Kibera station, Moi Girls School, Kabarnet road, and Mbagathi Way, and Golf Course edge	35	1.5	0.2	Maisonettes and town houses Mixed use: Residential and office development along Ngong road corridor	Densification of Woodley estate by the City Council; Shopping complexes (Nakumatt, Uchumi, etc.) to develop service lanes and bus stops on both sides of the road
	4I-Kabarnet Gardens - Kabarnet road, Golf Course edge,	35	0.75	0.2	Residential	Maintain existing character
5	5A-Upper Spring Valley, Loresho Estate	25	0.25	0.2	Residential	No development of flats and apartments Retain existing character Upgrade Loresho estate commercial node at junction of Loresho Ridge and Kaptagat road Provide for Kibagare Park as a public open space Offices, bars and restaurants not permitted outside the designated commercial node
	5B-Muthangari, Kianda, Bernard Estate, and Lavington	35	0.75	0.1 (S) 0.2 (US)	Residential single Dwelling	No development of flats and apartments Offices, bars and restaurants and residential hotels not permitted outside the designated commercial

						node Expansion of Lavington Green shopping centre as a designated commercial node Widen Gitanga road to 18 metres throughout
5C-Kianda triangle-Manyani road, Waiyaki way, and Hinga road	35	1.0	0.2	Residential		Allow flat development maximum four floors

Source: Department of City Planning, 2006

These policy recommendations were approved and became operational in 2007, they have been in use for guiding the development of the Kileleshwa estate area ever since.

5.3 ANALYSIS OF THE FINDINGS & RECOMMENDATIONS

From the comparisons of the previous policy and the recommended policy guidelines above, it emerges that the policy review achieved one of its aims; it created sub-zones from the former broader three zones i.e. zone 3, 4 and 5. For example zone 4 was sub-divided into 11 sub-zones these are; 4A, 4B1, 4B2, 4B3, 4C, 4D, 4E, 4F, 4G, 4H and 4I, each with specific ground coverage, plot ratios, minimum area and types of development allowed. The Kileleshwa estate is covered by two sub-zones i.e. 4C and 4D whose guidelines are shown in the table 5-2 below:

Table 5-2: Policy framework for sub-zone 4C and 4D

Zone	Sub Zone/ covered	Area	G.C. %	P.R. %	Min Area (Ha)	Type of Development	Remarks/ Policy issues
	4C Riverside Nairobi river, Kirichwa Ndogo, Ring road Kileleshwa, and		35	0.75	0.4 0.05	No Flats Single dwelling maisonettes or town houses on 0.05 ha	Conform to existing policy guidelines

boundary of zone 4 & zone 5						
4D Kileleshwa area: Kirichwa Ndogo, Kirichwa Kubwa, Muthangari road	35	1.0	0.4 0.05	Flats Single dwelling maisonettes or town houses on 0.05 ha	Regularize the existing flats; allow 10% for greenery; expand Kasuku Centre (to cover area within Migori Road, Laikipia Road and the Ring Road)	

Source: Adapted from; Department of City Planning, 2006

In the greater part of the Kileleshwa estate, which falls under sub-zone 4D; flats which in essence mean high rise residential developments have been allowed, in the previous policy guidelines it was categorical that apartments were allowed only on sewer and the limit on the number of floors was set at 4 storeys maximum. Though these particular guidelines are silent on the same it is hereby assumed that the directives on maximum number of floors allowed and that apartments should be on sewer only still holds. From the foregoing it can be concluded that the 2005/2006 policy review on the specific aspect of the densification of the Kileleshwa estate; it encouraged the further densification of the Kileleshwa estate.

Considering that the main purpose of the 2005/2006 policy review was to find solutions to the challenges that were brought about by the densification of the planning zones 3, 4 and 5, which as mentioned earlier could be summarised in the following categories:

- i) Inadequate infrastructure development (water, sewer, roads and drainage)
- ii) Traffic congestion
- iii) Over densification of housing developments
- iv) Incongruous developments
- v) Rising land values
- vi) Environmental degradation
- vii) Lack of adherence to development control measures

In relation to the above challenges and from field observations the following issues emerged:

- a) Since densification is still going on in Kileleshwa estate, the challenges of vegetation cover loss, encroachment on riparian reserves, interference and pollution of river courses, and increased surface run off is set to continue.
- b) Barriers in the form of gates to homes are predominant throughout the estate, there is no single property that is not gated, except for people who live in the same flat; it is almost impossible to increase social interaction

Plate 4-8: A gated properties within Kileleshwa



Source: Field Survey 2010

- c) New commercial nodes existing in the zones present an opportunity to relieve pressure on the main CBD, but the locations of these upcoming commercial nodes create an over dependence on motorised transport to get to these centres, thus the main CBD is relieved of the pressure especially traffic congestion, but the pressure is transferred wholesome to other locations.
- d) The Kileleshwa estate which is presented by planning zone 4 is still experiencing challenges from over densification of buildings that are not supported by infrastructure to

the emergence of ribbon developments along primary and secondary streets leading to proliferation of business centres and informal economic activities beyond the areas that had been designated as commercial zones.

Plate 4-8: Informal businesses along roads within Kileleshwa



Source: Field Survey 2010

- e) The flouting of the zoning policy and building development control regulation exists within the Kileleshwa estate, although this study could not access individual sites to ascertain instances of flouting plot ratios and ground coverage; from general observation of the character of the study area it is presumed these are flouted too. There was no observation of any informal settlements in all the areas that were visited for purposes of this study in the Kileleshwa estate.
- f) Loss of privacy especially from high-rise developments overlooking maisonettes and bungalows is predominant within the Kileleshwa estate where families have chosen to keep their low density nature developments.

Plate 4-9: Apartments overlooking other properties leading to loss of privacy



Source: Field Survey 2010

- g) The following observations were made during the field survey; the road bearing capacity has been exceeded within the Kileleshwa estate, junctions are poorly designed, only one bus stop exists, parking spaces are inadequate, the provision of non-motorised infrastructure is inadequate, the provision of sewer and water services is inadequate and prone to low water pressure during peak hours. Sewer blockages and overflows are experienced frequently.
- h) The Kileleshwa estate has public schools and a police station, but there is no public health facility in the estate and the administration facility meant to serve the estate is located in Westlands. There is no land reserved for public utilities except the road reserve which also serves as the only available open space within the estate.
- i) If what was observed in the fieldwork is anything to go by; then loopholes in the enforcement of the building control guidelines and zonal requirements still exists. Disconnect between development control policies and implementation exists, leading to

misinterpretation and flouting of existing development policies. An instance is the absence from the guidelines of the definitions of the floor levels leading some developers' to construct attics and penthouses on top of the fourth floor with the reason that an attic or penthouse does not constitute an extra floor.

j) The rise in land values and drop in property values still exists.

Thus it emerges from the above that the challenges that were meant to be addressed by the 2005/2006 policy review that is now in force in the zones 3, 4 and 5; including Kileleshwa estate still persists three years after the policy review recommendations were adopted and the challenges are set to grow worse as densification of the Kileleshwa estate continues.

The planning team also came up with various recommendations in the policy review; some of the recommendations attracted the following observations:

- The enforcement of building control regulations seems to be the biggest hurdle for the CCN especially when it comes to site visits and material testing. One development site visited in the Kileleshwa estate which is almost complete has never had a site visit from any concerned department from the CCN, thus pointing to lack of enforcement of the building development control regulations.
- The recommendation that the population in the Kileleshwa estate upholds the high values of the neighbourhood characteristics is a tall order; given the “gated nature of the community” and the lack of social interaction that exists.
- When one thinks about involving neighbourhood associations from the estates in city governance, the following questions come to mind:
 - To what extent can neighbourhood associations be involved in governance?
 - With no planning office or staff at the sub-zone level, how will the information on planning and development be disseminated?
- As envisaged in the Nairobi Master Plan of 1948 on neighbourhoods with convenient walking distances for accessing the needs of a daily life, it emerges that this is not happening in the Kileleshwa estate and has encouraged the opposite i.e. the over dependence on motorised transport to access the needs of a daily life. The personal car is the preferred means of travelling with a few *matatus* complementing the private cars.

- The reviewed policy also recommended a continuous policy review process for the envisaged visions to be realised; but does not provide a time frame as to when each policy review ought to be carried out. Had a time frame been provided, it would have made it easier for concerned authorities to plan better and budget for such activities.
- The specific locations for corner shops and informal economic activities has not been planned as recommended, thus leading to the proliferation of informal businesses and shops located on property walls and road junctions throughout the Kileleshwa estate. Plate 4-10 exemplifies businesses located on property walls which are predominant in the estate.

Plate 4-10: A shop located on a residential property wall



Source: Field Survey 2010

- The restriction of commercial developments to designated commercial zones as recommended has also not happened as exemplified on Plate 4-11 below where a chemist is located outside the designated zones.

- The idea of re-zoning of areas where pressure is insurmountable as suggested is more of planning following development rather planning preceding development which is hereby considered inappropriate.

Plate 4-11: A chemist outside the designated commercial zone



Source: Field Survey 2010

- The linkages between formal residential neighbourhoods and informal settlements have not been fostered. The same applies to; the ring fenced infrastructure, the institutionalisation of participation of the public, the harmonisation of policies and regulations, the sub-zonal plans with specific land-use plans, sub-zonal guidelines and requirements have not been developed.
- The policy review recommendation on the implementation of the missing links, link roads and development of the propose by-pass in the Kileleshwa estate seems to be taking shape, as can be exemplified by Plate 4-12 below.

Plate 4-12: A section of the by-pass within Kileleshwa



Source: Field Survey 2010

- With the ever increasing traffic congestion in all major cities in the world, which is largely blamed on the personal car, the policy still recommended increased car parking requirements from 1.5 to 2 or 3 for higher socio-economic groups. More parking places at the households of the higher economic groups would likely lead to purchasing more cars to fill the available parking spaces, this is likely to bring more congestion to a road network that is already under a lot of pressure. The provision of more parking spaces is a short term solution to a problem whose ultimate answer is an efficient and affordable public transport system.
- Planning as an activity takes place within the confines of the law, and it only exercises powers for which it has been granted by the law. The policy recommended punitive measures and radically stiff penalties which can be challenged in courts of law if they are not provided for in the existing law. Putting in mind that local authorities in Kenya including the CCN suffer from perennial cash flow problems, the compensations to

developers as a result of such punitive measures and radically stiff penalties might negatively affect the functions of the city council. The policy review missed the point that the problem is not of the inadequacy of existing penalties and measures, but one of incapacity to effectively control and guide development by the CCN. The focus should have been on how to improve the capacity of the CCN to effectively control and guide development.

- The idea of creating key commercial areas and nodal developments is great, but in the past many such areas especially in the city of Nairobi have developed not because of any planning intervention but because of market forces and planning only comes in to “formalise” such centres. The policy recommendation fails to clearly spell out what will bring about such change.

FIGURE 10.1: A bar chart showing the distribution of land use across different zones in Nairobi. The x-axis represents different zones, and the y-axis represents the percentage of land area. The bars show varying heights, indicating different proportions of land use in each zone.



The chart illustrates the distribution of land use across different zones in Nairobi. The x-axis represents different zones, and the y-axis represents the percentage of land area. The bars show varying heights, indicating different proportions of land use in each zone. The highest percentage of land area is in Zone 3, followed by Zone 2, Zone 4, Zone 5, Zone 1, Zone 6, and Zone 7.

CHAPTER SIX-PERCEPTIONS FROM KILELESHWA ESTATE RESIDENTS

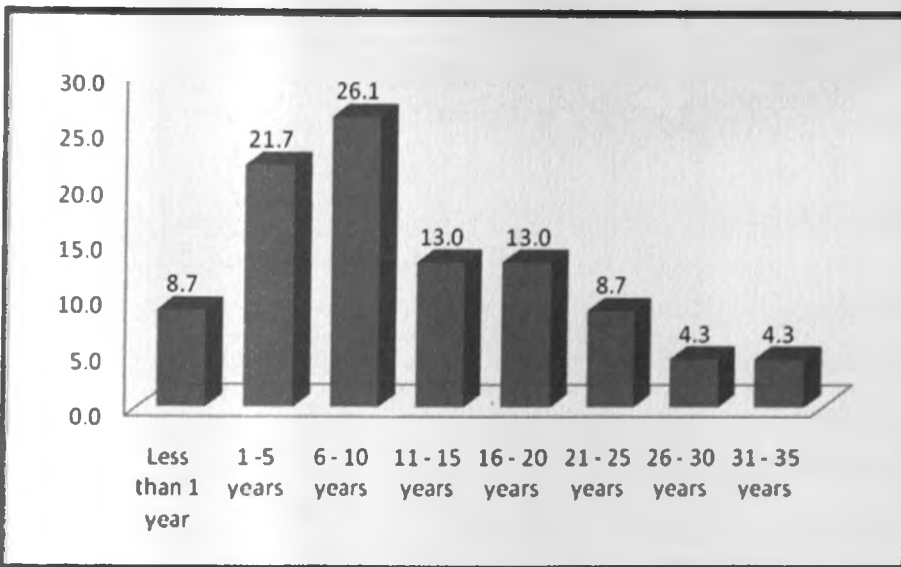
6.0 INTRODUCTION

This chapter discusses the emerging issues as regards challenges faced by the Kileleshwa estate residents both at the households and business levels with a view of forming a base on which to compare the challenges before the 2005/2006 policy review and the challenges that exist now. The comparison will help examine the impacts of the policy review on alleviating the challenges that had earlier been identified as emanating from the densification of planning zones 3, 4 and 5 which were low density residential areas.

6.1 HOUSEHOLDS

6.1.1 Length of stay in Kileleshwa estate

Figure 6-1: Length of stay in Kileleshwa estate



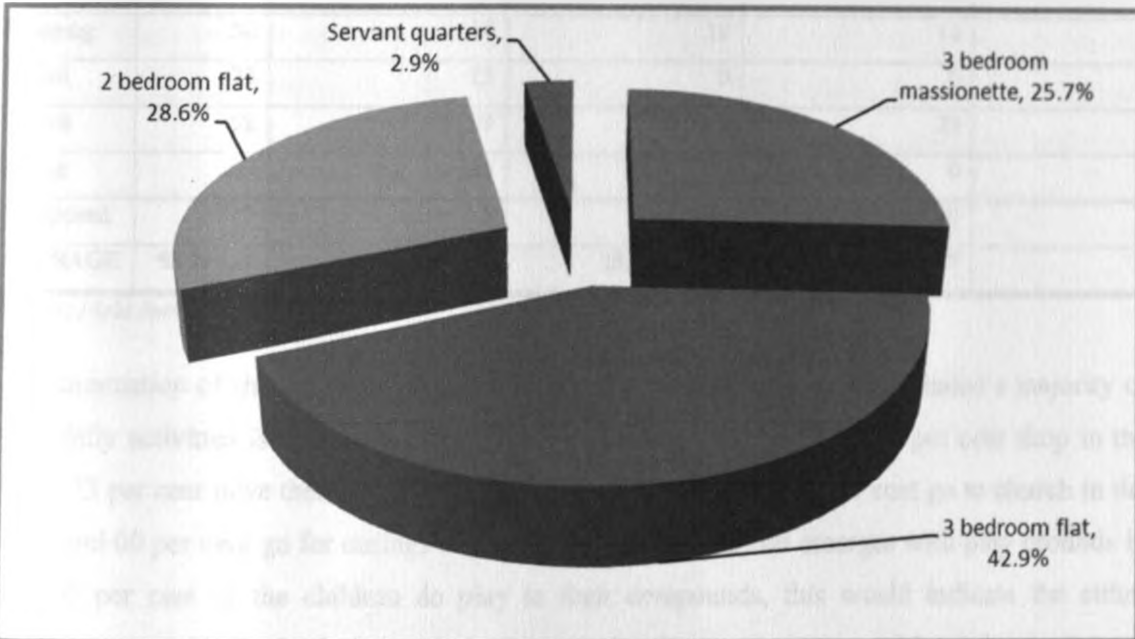
Source: Field Survey 2010

The field survey revealed that 8.7 per cent of the respondents have lived in the estate for less than a period of 1 year, 21.7 per cent between 1-5 years, 26.1 per cent between 6-10 years, while 43.3 per cent have lived in Kileleshwa estate for over 11 years. From the above, it is also evident that 69.4 per cent of those subjected to the study have lived in the study area for more than 6 years thus they are likely to be aware of the 2005/2006 policy review, appreciate the changes

that have been brought about by the policy review and to participate in recommending policy options towards a sustainable development of the Kileleshwa estate.

6.1.2 Housing typologies

Figure 6-2: Housing typologies



Source: Field Survey 2010

The housing typologies in Kileleshwa estate indicates that 71 per cent of the house typologies are high rise residential flats, where 28 per cent of these are 2 bedroom flats while 43 per cent are 3 bedroom flats respectively. There are also maisonettes that constitute 26 per cent of the housing typologies, while 3 per cent constitute servant quarters which are basically what is commonly known as “bed sitter”; comprising of an area to fit a bed, a cooking space and a bathroom/toilet. From the above it emerges that the Kileleshwa estate is generally transforming to an all high rise residential estate, although 26 per cent of the house typologies are maisonettes, but they are not new developments and they are remnants of what were formerly institutional houses. It is worth mentioning that with time the bungalows and maisonettes will be out bid by high rise residential developments in the Kileleshwa estate which will then become an exclusively high-rise residential estate.

6.1.3 Activity locations

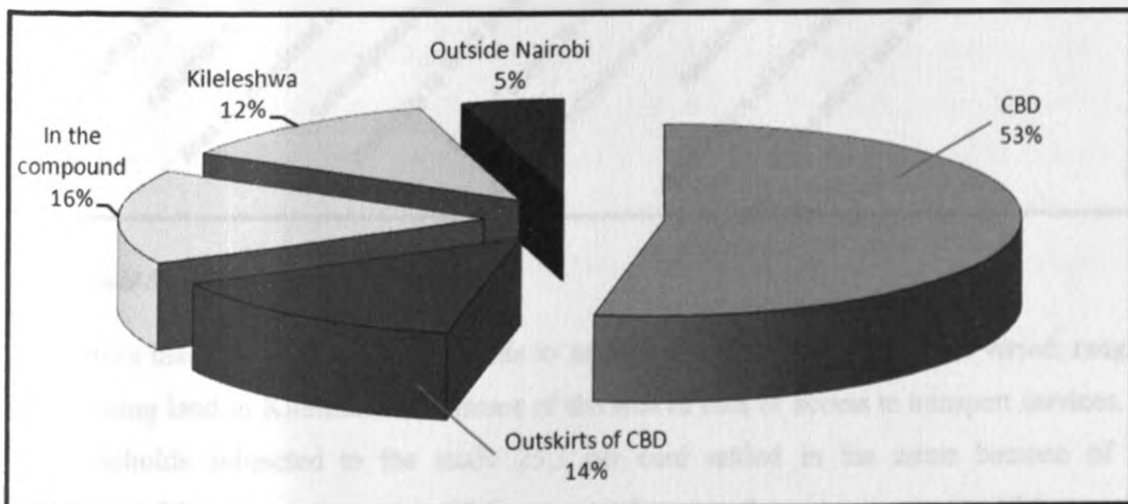
Table 6-1: Activity locations

ACTIVITY	ACTIVITY LOCATION (PERCENTAGE)				
	CBD	Outskirts of CBD	In the compound	Kileleshwa	Outside Nairobi
Work	74	16	10	0	0
Shopping	50	18	18	14	0
School	73	13	0	0	14
Church	52	19	0	29	0
Outing	60	20	7	0	13
Playground	10	0	60	30	0
AVERAGE	53.16667	14.33333333	15.83333333	12.16666667	4.5

Source: Field Survey 2010

An examination of the activities of the residents of the Kileleshwa estate revealed a majority of their daily activities is done in the CBD; 74 per cent work in the CBD, 50 per cent shop in the CBD, 73 per cent have their children going to school in the CBD, 52 per cent go to church in the CBD and 60 per cent go for outings in the CBD. A different trend emerges with play grounds in that 60 per cent of the children do play in their compounds, this would indicate the either developers provide such playgrounds in the new developments or the children play in the car parks and garden spaces provided.

Figure 6-3: Average of all activity locations as percentages

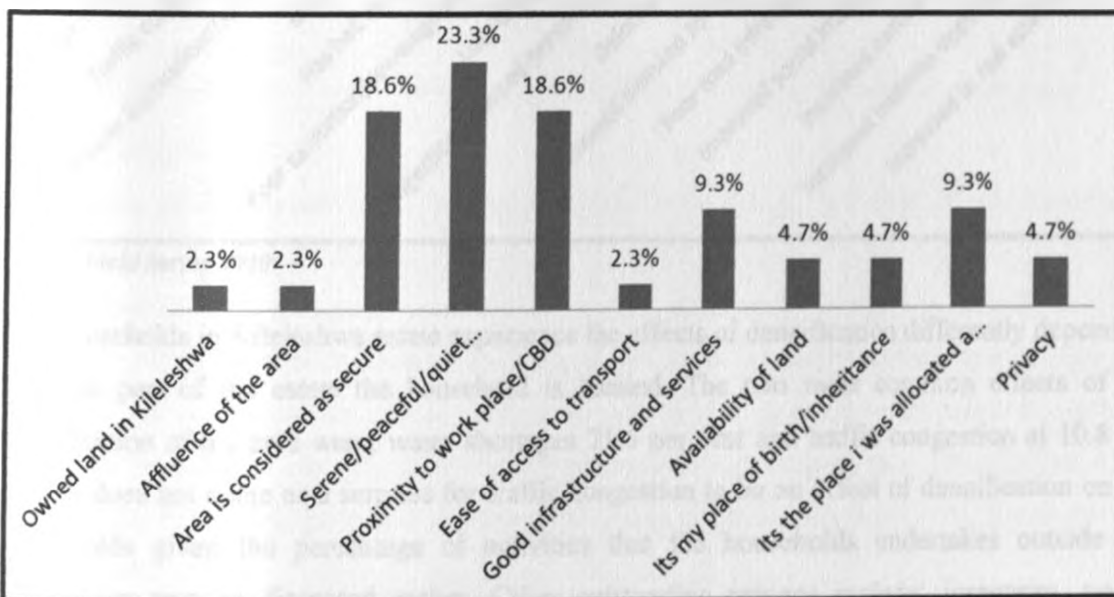


Source: Field Survey 2010

An analysis of the average percentages of the activity locations of the households as shown in figure 6-3 above, reveals that 68 per cent of the households have their activity area located in the CBD and its outskirts, while the activities that take place in the Kileleshwa area including within the compound of the household accounted for only 18 per cent. This has an implication that the households in Kileleshwa estates are heavily dependent on motorised transport to enable them perform their various daily activities. This is contrary to what was envisaged in the neighbourhood unit concept that was recommended in the 1948 master plan which envisaged neighbourhoods within walking distances to activity centres. The dependence on motorised transport is contributing to an already existing situation of traffic congestion experienced all over the city and specifically the CBD where the problem is even worse.

6.1.4 Factors that influenced the settling in Kileleshwa estate

Figure 6-4: Factors that influenced settling in Kileleshwa estate



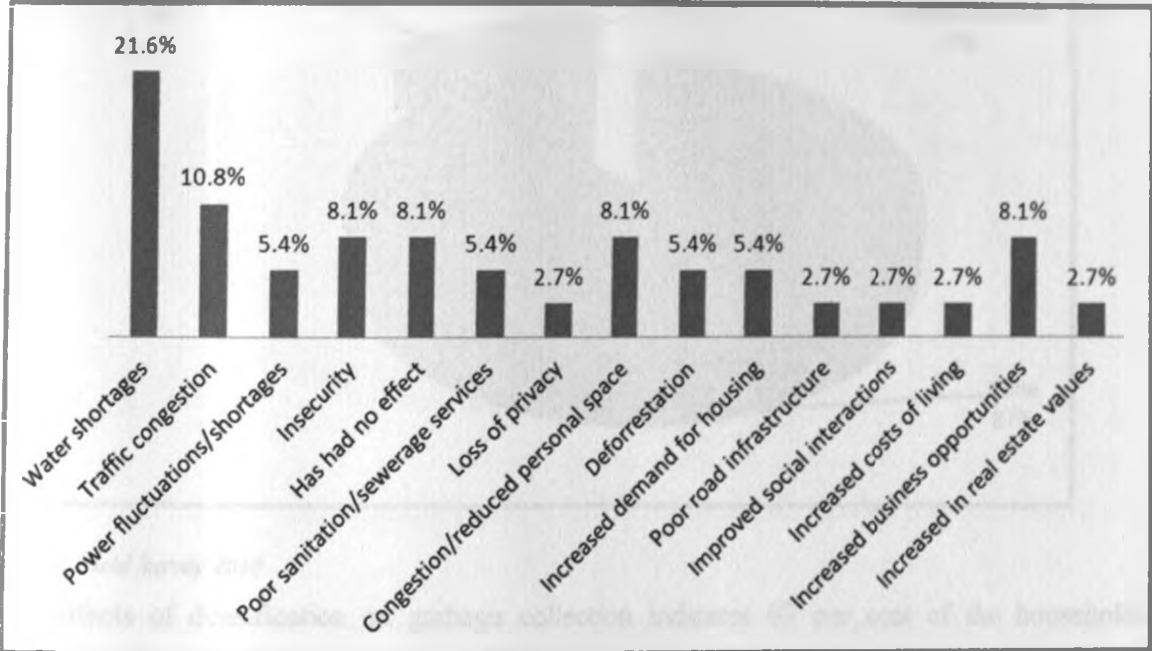
Source: Field Survey 2010

The factors that influenced the households to settle in the Kileleshwa estate are varied; ranging from owning land in Kileleshwa, affluence of the area to ease of access to transport services. Of the households subjected to the study 23.3 per cent settled in the estate because of the serene/peaceful/quiet environment, 18.6 per cent because the area is secure, 18.6 per cent

because of the areas proximity to the CBD. Other reasons included good infrastructure, availability of land and the privacy that the estate offers to individual households.

6.1.5 Effects of densification on the households

Figure 6-5: Effects of densification on the households

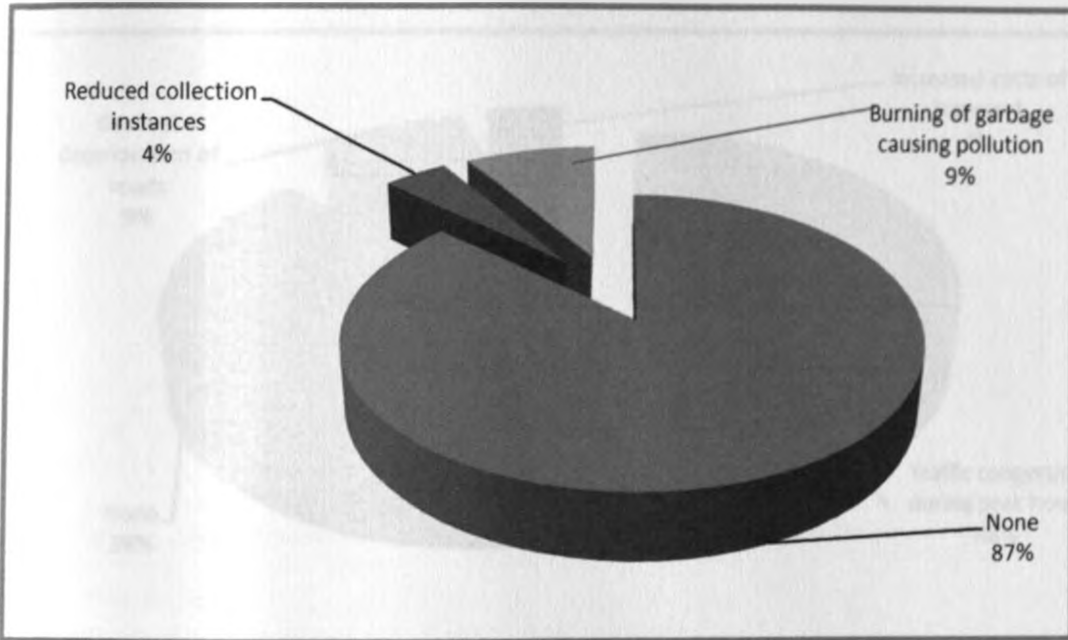


Source: Field Survey 2010

The households in Kileleshwa estate experience the effects of densification differently depending on what part of the estate the household is located. The two most common effects of the densification of the area were; water shortages 21.6 per cent and traffic congestion at 10.8 per cent, it does not come as a surprise for traffic congestion to be an effect of densification on the households given the percentage of activities that the households undertakes outside the Kileleshwa area as discussed earlier. Other outstanding reasons include; insecurity, power fluctuations, poor sanitation and sewerage services, loss of privacy and poor road infrastructure.

6.1.6 Effects of densification to garbage collection

Figure 6-6: Effects of densification garbage collection

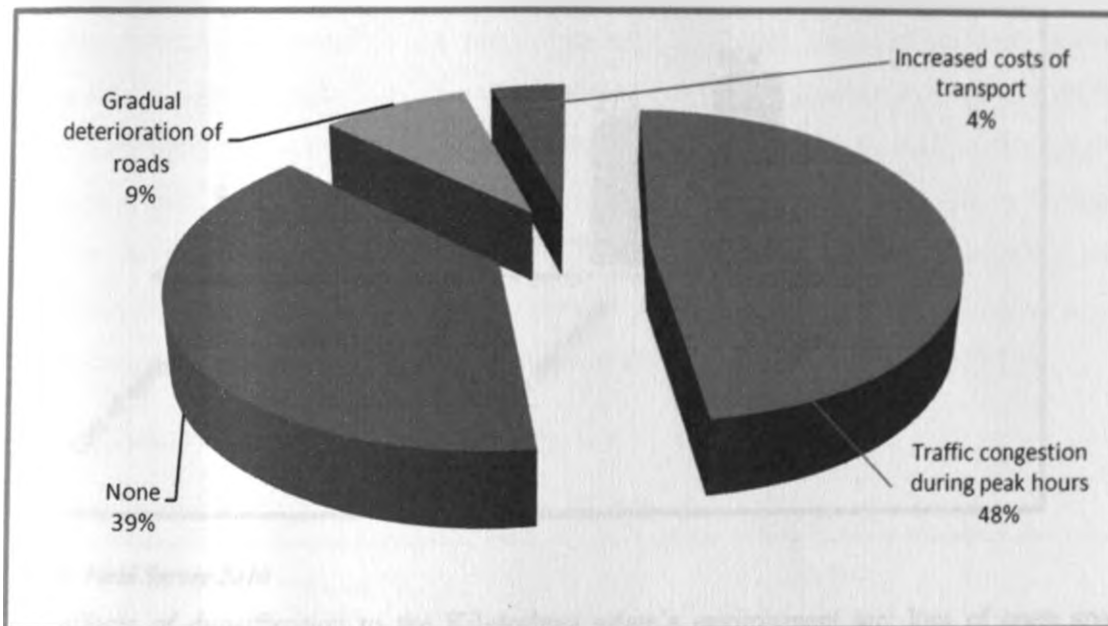


Source: Field Survey 2010

The effects of densification on garbage collection indicates 87 per cent of the households experience no effect of the densification on garbage collection, this is attributed to the fact that in the Kileleshwa area garbage is collected by private companies, so there is actually minimal effects to garbage collection because as the area gets more densely populated it translates into more business for the private garbage collecting companies. Given the competition for garbage collection the services can only get better. There are still instances of reduced collection 4 per cent even by the private garbage collectors and burning of solid waste 9 per cent thus generating air pollution.

6.1.7 Effects of densification to transport

Figure 6-7: Effects of densification to transport

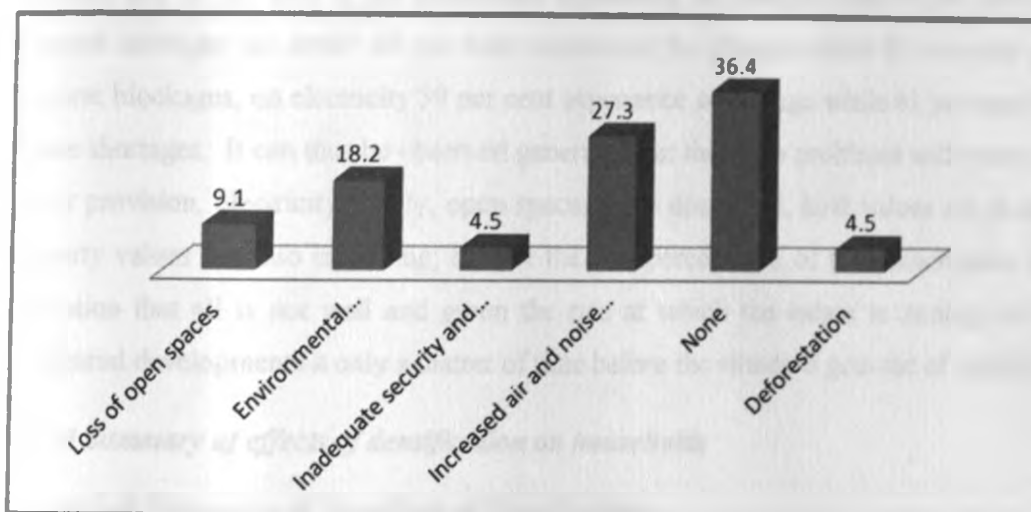


Source: Field Survey 2010

The densification of the Kileleshwa estate is impacting on the household transportation as follows; 48 per cent experience congestion during peak hours, 39 per cent do not experience any effects of densification on transportation, 9 per cent experience gradual road deterioration and 4 per cent are experiencing increased costs on transport. The cumulative effects of the effects of densification on transportation apart from those experiencing no change is 61 per cent experiencing various negative effects including traffic congestion, deterioration of roads and increased cost of transportation. It can hereby be observed generally that densification is impacting negatively on transportation in the Kileleshwa estate.

6.1.8 Effects of densification to the environment

Table 6-8: Effects of densification on the environment



Source: Field Survey 2010

The effects of densification to the Kileleshwa estate's environment are; loss of open spaces, environmental degradation (this can be illustrated by instances of dumping garden waste on some streets), increased air and noise pollution (mainly from vehicle exhaust fumes and noise from construction sites). Deforestation occurs due to the cutting down of trees to pave way for construction activities. 36.4 per cent did not experience any effect of densification on their immediate environment.

6.1.9 Effects of densification on other sectors

Table 6-2: Effects of densification per sector

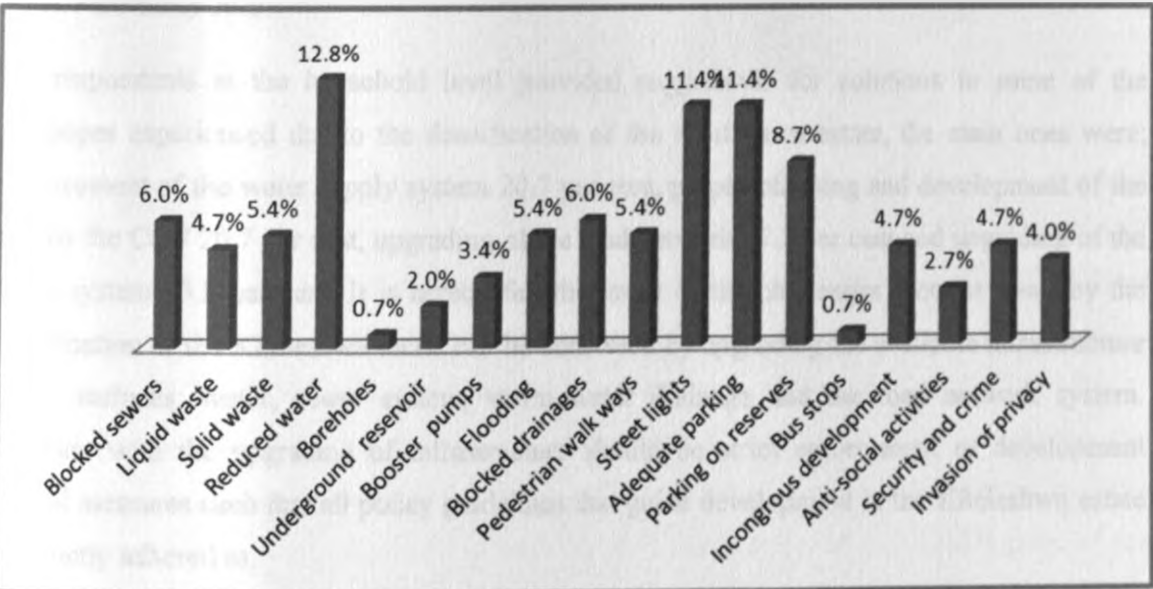
Sector	Effects	
Water	No effect 30%	Frequent shortages 70%
Sewer	No effect 65%	Frequent blockages 35%
Property values	Gone down 4 %	Gone up 96%
Land values	Gone down 9 %	Gone up 91%
Open spaces	No effect 45 %	Decreased 55%
Electricity	No effect 39%	Power shortages 61%

Source: Field Survey, 2010

As earlier indicated different households located in different parts of the Kileleshwa estate experience the effects of densification differently, in table 4-6 above the effects on water indicates that 30 per cent of the households experience no change while 70 per cent experience frequent shortage, on sewer 65 per cent experience no change while 35 per cent experience frequent blockages, on electricity 39 per cent experience no change while 61 per cent experience power shortages. It can thus be observed generally that there are problems with water provision, sewer provision, electricity supply, open spaces have decreased, land values are escalating and property values are also escalating; despite the low percentages of the occurrences, it's a clear indication that all is not well and given the rate at which the estate is turning into high rise residential developments it only a matter of time before the situation gets out of control.

6.1.10 Summary of effects of densification on households

Figure 6-9: Summary of the effects of densification

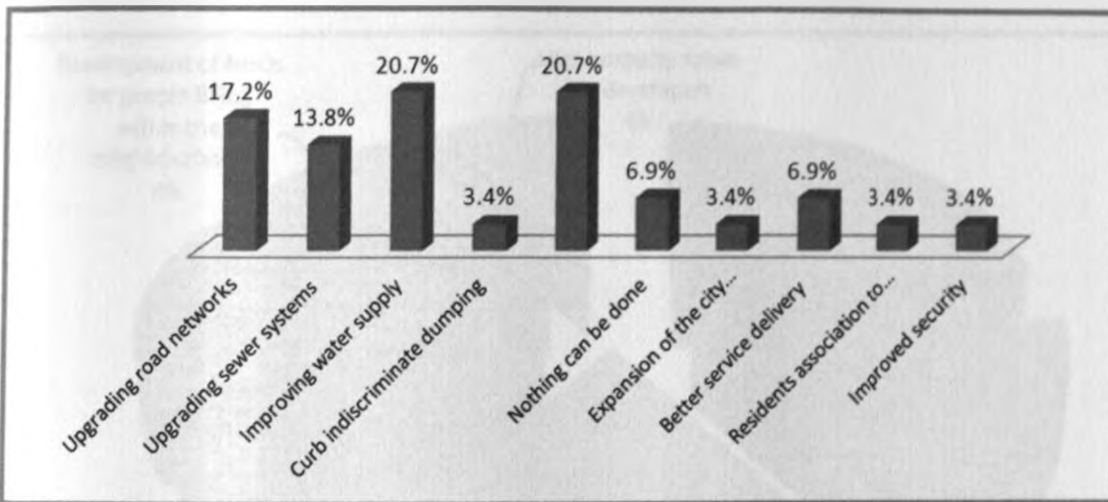


Source: Field Survey 2010

The table 6-10 above summarises all the effects of densification in the Kileleshwa estate, the main ones have already been discussed in detail in subsequent sections, and it was felt there was need to also highlight the minor effects so as to acknowledge their existence in the study area, these included; blocked storm water drainages, lack of pedestrian walk ways, parking on road reserves, lack of designated bus stops, incongruous developments and increased anti social activities among others.

6.1.11 Perceived solutions to challenges brought about by densification on the households

Figure 6-10: Solutions to challenges brought about by densification

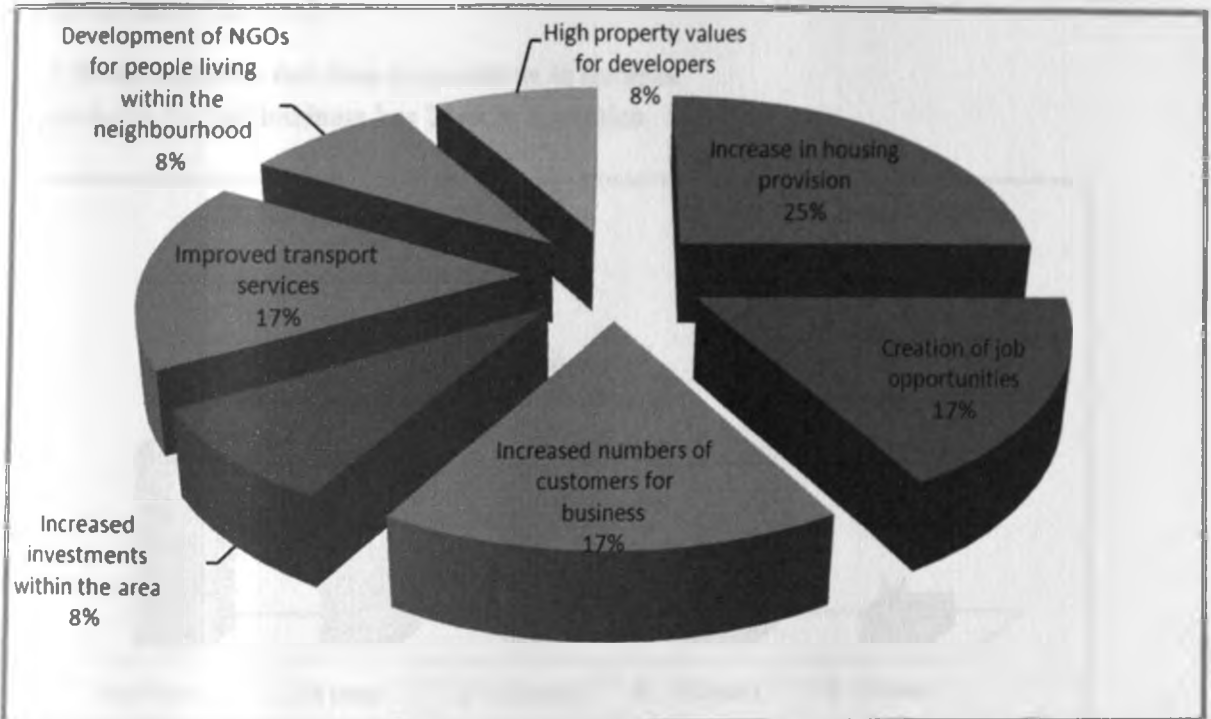


Source: Field Survey 2010

The respondents at the household level provided suggestions for solutions to some of the challenges experienced due to the densification of the Kileleshwa estate, the main ones were; improvement of the water supply system 20.7 per cent, proper planning and development of the area by the CCN 20.7 per cent, upgrading of the road network 17.2 per cent and upgrading of the sewer system 13.8 per cent. It is hereby felt that most of the challenges brought about by the densification of the Kileleshwa estate can be addressed by upgrading the available infrastructure which includes; water, sewer system, storm water drainage and the road network system. Together with the upgrading of infrastructure should be strict enforcement of development control measures such that all policy guidelines that guide development in the Kileleshwa estate are strictly adhered to.

6.1.12 Perceived benefits of densification

Figure 6-11: The benefits of densification



Source: Field Survey 2010

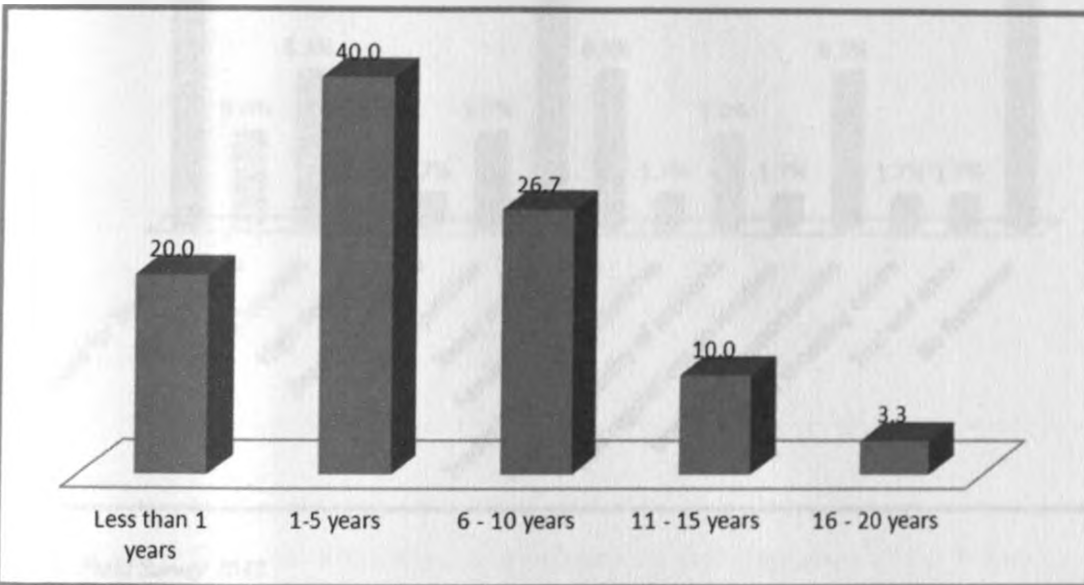
The respondents were asked whether there were any benefits to densification in the Kileleshwa estate at the household level; 57 per cent of the respondents agreed that there were benefits to the densification of the Kileleshwa estate while 43 per cent were of the opinion that there were no benefits. Because many of the challenges have already been mentioned which support the “no benefits” option, the study sought to find the benefits of the densification of Kileleshwa estate as experienced at the households level. It emerged that the benefits of the densification of the Kileleshwa estate were; Increased housing provision 25 per cent, increased number of customers for business 17 per cent, improved transport services 17 per cent (this could be explained by the existence of some public service vehicles which serve the various sections of the Kileleshwa estate, a service that was not there some years back), increased investments in the area and high property values and the development. The biggest beneficiaries of the densification exercise are the property developers who are taking advantage of the property market boom to make colossal profits, the land owners who are selling their land at prices never imagined before, the business

people who are setting up all sorts of business enterprises within the Kileleshwa estate and lastly the people looking for houses and property to within the Kileleshwa estate.

6.2 BUSINESS PEOPLE

6.2.1 Period business has been in operation in the area

Figure 6-12: Period business has been in operation

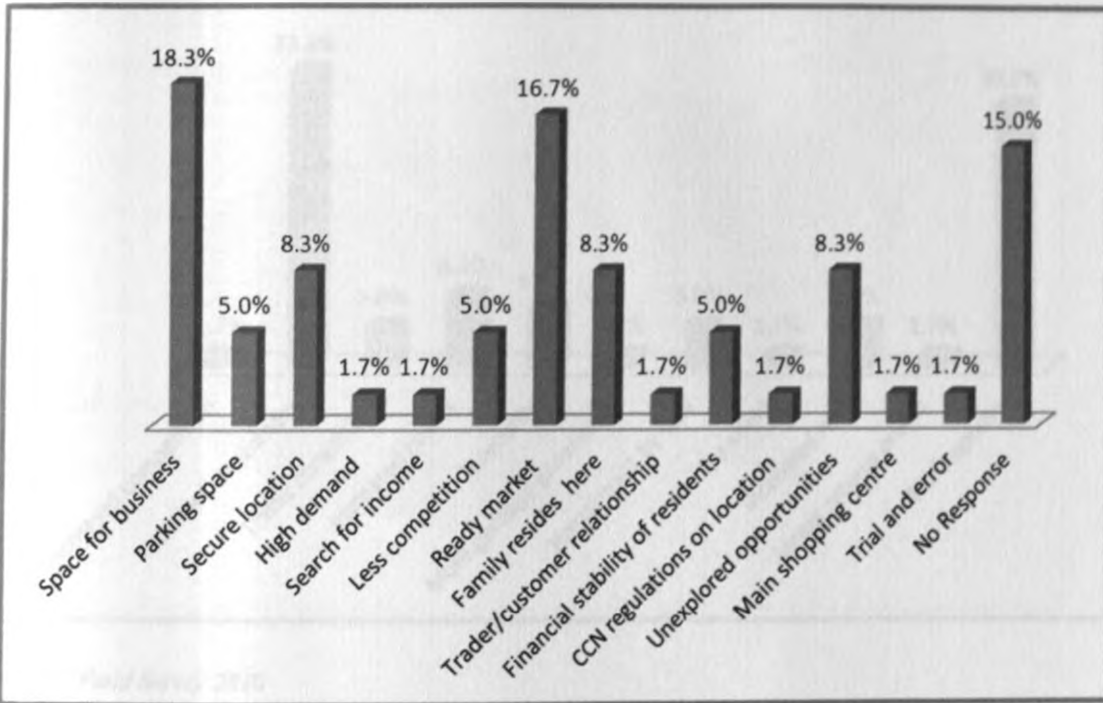


Source: Field Survey 2010

The business people operating in the Kileleshwa estate were classified as follows; those that have been in operation for less than 1 year were 20 per cent, those that have been in operation between 1-5 years were 40 per cent and those who have in operation between 6-10 years were 26.7 per cent. Considering all businesses that have been in operation in the area in for up to five years, it emerges that 60 per cent of the businesses in the study area have been set up in the last 5 years. This indicates that there are factors that are unique in the Kileleshwa estate that are attracting businesses one of which is the increased population that provides a ready market for goods and services. On the other hand businesses operating in the area and have been there for over six years accounted for 40 % a trend that could be explained by upward mobility of the establishments as they move to more promising markets outside the study area.

6.2.2 Factors that influenced location of business in Kileleshwa

Figure 6-13: Factors that influenced location of business in Kileleshwa

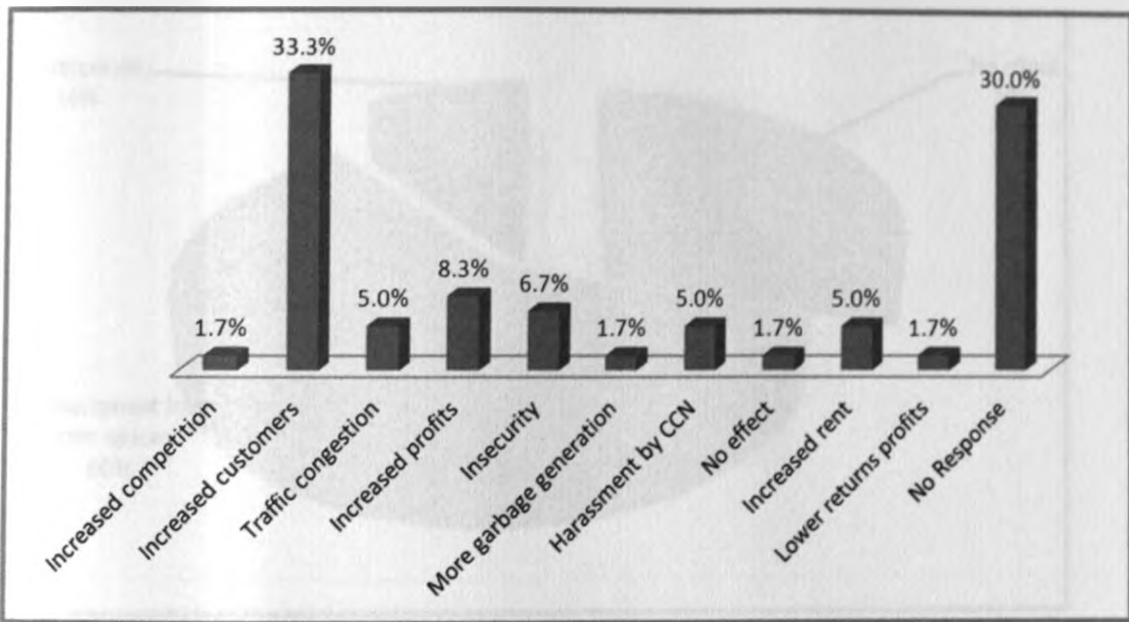


Source: Field Survey 2010

The main factor that has influenced the location of businesses in the Kileleshwa estate is the availability of space for doing business at 18.3 per cent, a ready market for products at 16.7 per cent, other reasons at 8.3 per cent are the availability of secure locations, unexplored market opportunities and the family residing in the same area that the business is located. The last reason offers an insight into the existence of some residential properties that have shops on their property boundary walls a trend that should be greatly discouraged in favour of the designated commercial centres.

6.2.3 Effects of densification on businesses

Figure 6-14: Effects of densification on businesses

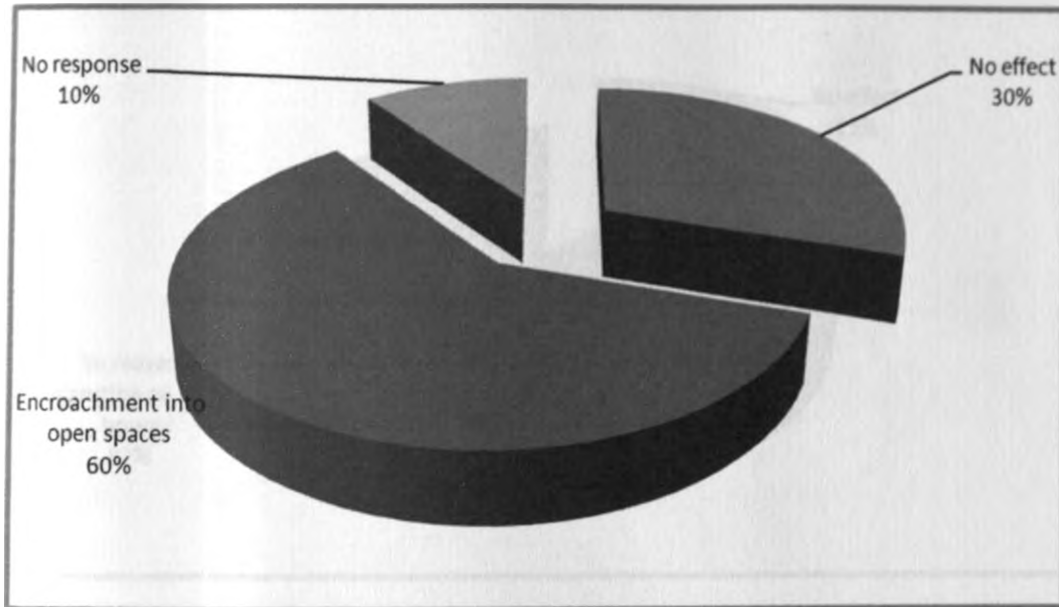


Source: Field Survey 2010

The densification of the Kileleshwa area is affecting the businesses in the following ways; positively they are experiencing increased customers 33.3 per cent and increased profits at 8.3 per cent, negatively they are experiencing insecurity 6.7 per cent, traffic congestion, harassment by CCN 'askaris 'and increased rents for spaces for doing business. It is hereby noted that 30 per cent of the respondents did not give an answer to this question due to suspicion on the true purposes of the research despite assurances that it was purely for academic purposes.

6.2.4 Effects of densification on public open spaces

Figure 6-15: Effects of densification on public open spaces

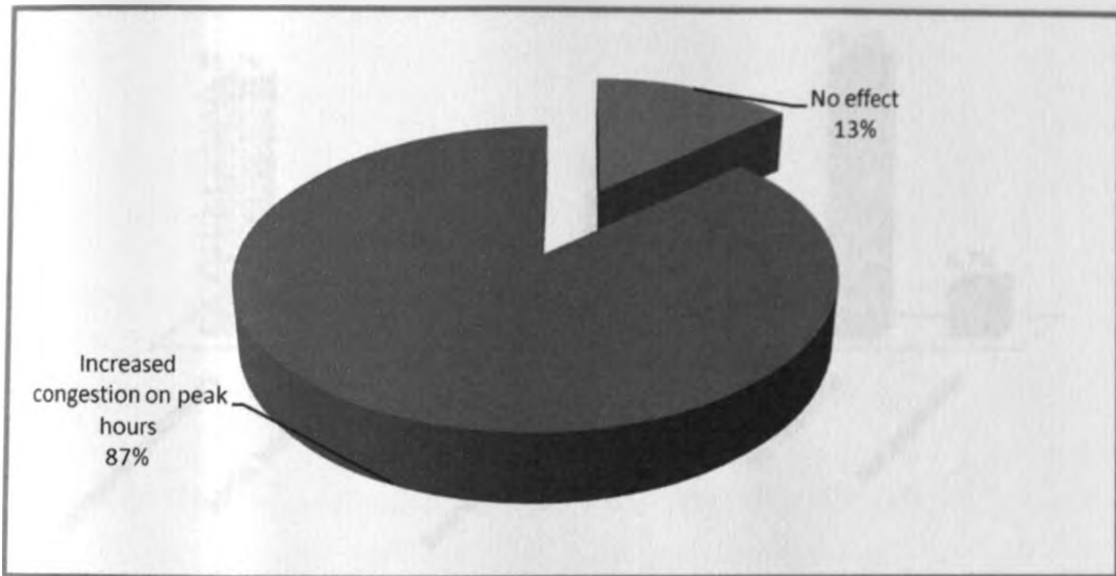


Source: Field Survey 2010

The responses on the effect of densification to public open spaces has 60 per cent of the respondents confirming the encroachment into open spaces, 30 per cent saw no effect of densification on public open spaces, while 10 per cent of the respondents had no comments. It was realised during the field survey that there are no public open spaces in the study area except for the arboretum which is outside the demarcation of the Kileleshwa estate and that most of the people understood public open spaces to mean road reserves. The effects of densification public open spaces as viewed through the occurrences at the wider city of Nairobi arena has been encroachment into these spaces by various interests especially those in the informal sector who locate most of their businesses on these spaces, Kileleshwa estate is no exception as it was observed earlier in the location of informal businesses on road reserves.

6.2.5 Effects of densification on vehicular traffic

Figure 6-16: Effects of densification on vehicular traffic

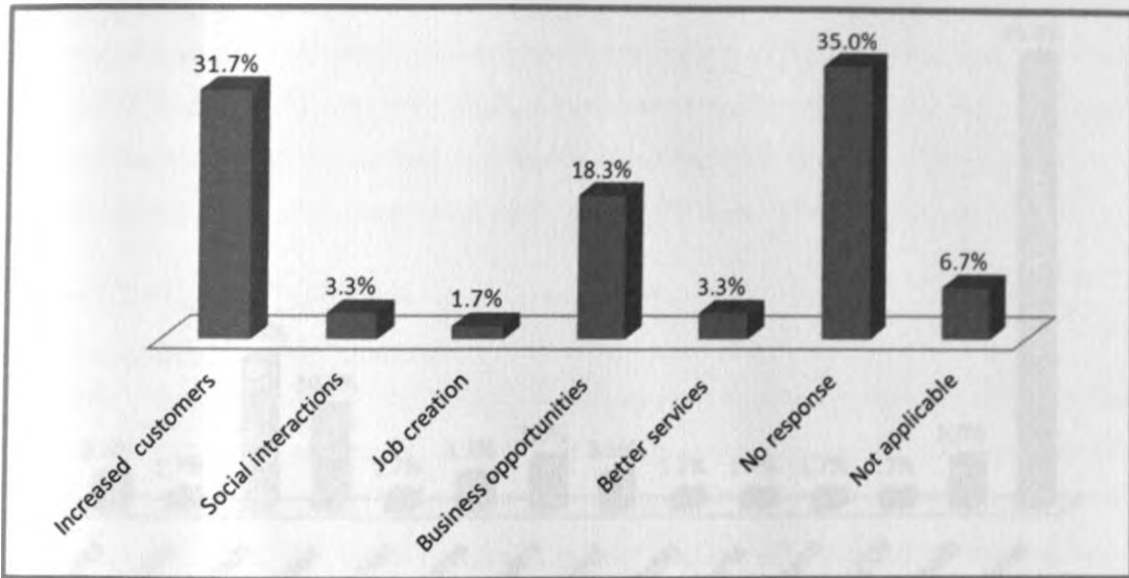


Source: Field Survey 2010

The effects of densification on traffic in the Kileleshwa estate emerged clear from the study findings in that 87 per cent of the respondents experienced increased traffic congestion during peak hours, while 13 per cent saw no effect of densification on the traffic. The no effect response can be attributed to the locations of the businesses in areas that traffic congestion is never experienced especially on roads that do not form the main transport corridor transversing the Kileleshwa estate. From the foregoing it is observed that the effect of densification on vehicular traffic is congestion during peak hours within the Kileleshwa estate, this is also a phenomenon that is affecting many other estate which have road corridors leading to the CBD. The problem of vehicular traffic congestion during peak hours ought to be looked at from the scale of the wider city of Nairobi if it is to be dealt with effectively and not at individual estate levels in isolation such as the Kileleshwa estate.

6.2.6 Perceived benefits of densification by the business people

Figure 6-17: Perceived benefits of densification by the business people

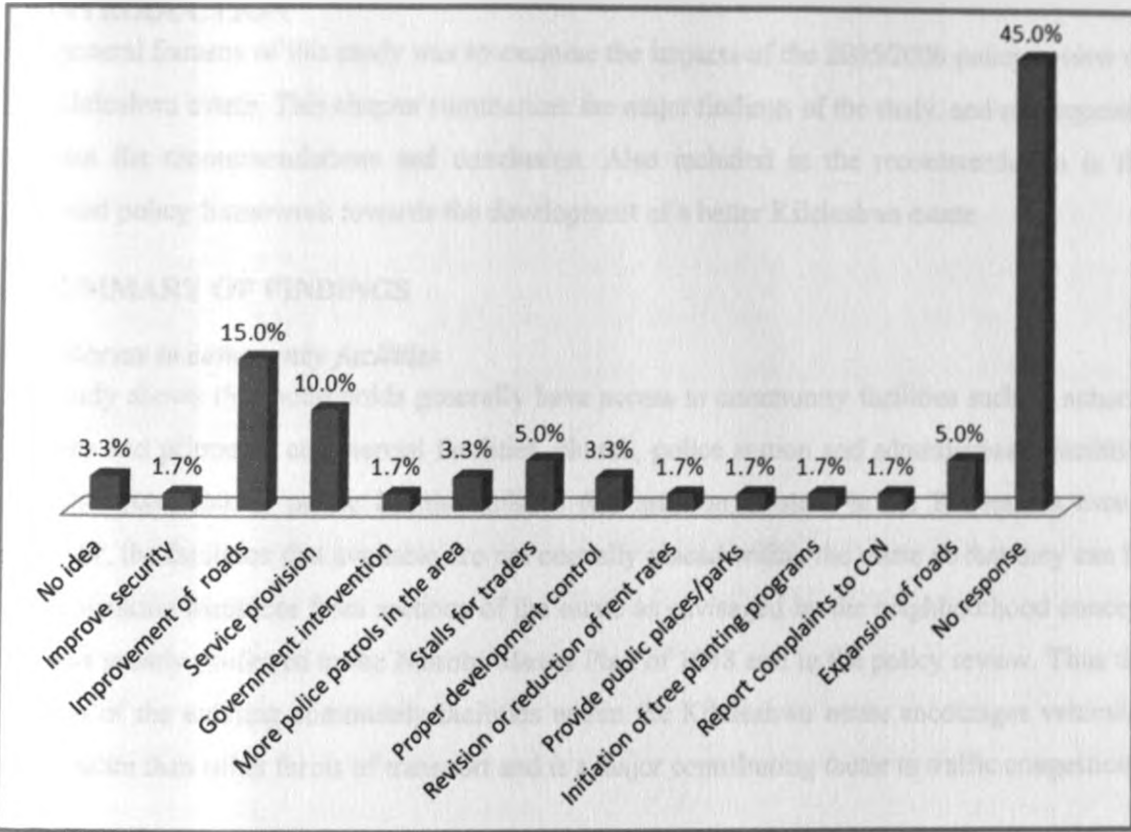


Source: Field Survey 2010

The perceived benefits of densification of the Kileleshwa estate to the business people were; increased customers for the businesses 31.7 per cent, more business opportunities 18.3 per cent, while other benefits included improved social interaction 3.3 per cent and job creation in the estate. The major benefits of the densification of the Kileleshwa estate to the business people is the increase in the number of customers as more people move to live in the Kileleshwa estate, this in turn has the possibility of attracting more business people to the area with the promise of a ready market thus increasing the numbers of businesses in operation in the study area. Of the respondents 35 percent did not respond to this question which is attributed to the observation that most of the business people were more eager to talk about the problems affecting their businesses than the benefits they derived from the same especially where financial matters were involved.

6.2.7 Perceived solutions to the challenges brought about by densification

Figure 6-18: Perceived solutions to the challenges brought about by densification



Source: Field Survey 2010

The respondents were offered an opportunity to give their perception on how the negative effects brought about by the densification of the Kileleshwa estate could be addressed, the main suggestions were; improvement of roads 15 per cent, better service provision by the CCN and the creation of stalls in the area for traders 5 per cent. Other suggestions included; more police patrols and proper development control enforcement. From the foregoing as earlier explained, the solution to the challenges brought about by the densification of the Kileleshwa estate lies in the following; upgrading the available infrastructure which includes; water, sewer system, storm water drainage and the road network system. Together with the upgrading of infrastructure should be strict enforcement of development control measures such that all policy guidelines that guide development in the Kileleshwa estate are strictly adhered to.

CHAPTER SEVEN-SUMMARY OF FINDINGS, RECOMMENDATION AND CONCLUSION

7.0 INTRODUCTION

The general focuses of this study was to examine the impacts of the 2005/2006 policy review on the Kileleshwa estate. This chapter summarizes the major findings of the study, and subsequently presents the recommendations and conclusion. Also included in the recommendation is the proposed policy framework towards the development of a better Kileleshwa estate.

7.1 SUMMARY OF FINDINGS

7.1.1 Access to community facilities

The study shows that households generally have access to community facilities such as schools (nursery and primary), commercial facilities, church, police station and administration facilities with the exception of public health facilities that are non existent in the Kileleshwa estate. However, the facilities that available are not centrally placed within the estate so that they can be within walking distances from sections of the estate as envisaged by the neighbourhood concept that was greatly preferred in the Nairobi Master Plan of 1948 and in the policy review. Thus the location of the existing community facilities within the Kileleshwa estate encourages vehicular traffic more than other forms of transport and is a major contributing factor to traffic congestion.

7.1.2 Poor development control

According to the Physical Planning Act (Cap 280) and the Local Government Act (Cap 265), the responsibility of development control within the city of Nairobi is vested in the City Council of Nairobi. But the field survey found out that there are several developments that exist within Kileleshwa estate that are clearly not in conformity with any provisions provided for in the legislation, by-laws or policy guidelines. These developments include; food kiosks, furniture shops, barber shops, groceries, butcheries and other illegal structures that have been erected on primary streets, secondary streets and along the road reserves. Similarly the areas zoning regulations further articulates that high rise residential development should be limited to four floors, however, it was evident that several residential developments within the Kileleshwa estate exceed the stipulated floor limit.

7.1.3 Limited investment in infrastructure services

Kileleshwa estate over the recent years has experienced an increase in population which has been accelerated by increased densification of the area. Residential developments were previously single family bungalows and maisonettes that are being replaced by high-rise multi-family developments. The City Council of Nairobi on the hand is doing to increase the capacity of the existing infrastructure such as water supply, sewer reticulation systems, roads and solid waste management among others. For instance, solid waste collection is one of the core responsibilities of the City Council of Nairobi, but this service in the Kileleshwa estate is undertaken by private operators because the city council is unable to offer this service. With no concrete plans in the near future to invest in infrastructure and service provision, the challenges faced by the residents of Kileleshwa are set to continue.

7.1.4 Poor maintenance of existing infrastructure facilities

Most of the existing infrastructure facilities in Kileleshwa are poorly maintained as evident by dilapidated roads, blocked storm water drainages and blocked sewer systems. Poor maintenance of the infrastructure has significantly contributed to several problems in the estate. For example, roads which are poorly maintained directly accelerate traffic congestion especially during peak hours, such roads also indirectly increase transport costs related to vehicle maintenance. Poorly maintained water pipes directly contribute to water shortages within some sections of the Kileleshwa estate.

7.1.5 Loss of privacy

The existing bungalows and maisonettes within the Kileleshwa estate are experiencing a severe cases of loss of privacy especially those that are surrounded by the high-rise residential developments, in such cases the owners of such properties are either forced by circumstances to either relocate to other remaining low density residential estates within the city or sell their property to developers and move into flats if they still desire to live in the same estate. This is a situation which is unfortunate especially where emotions, a sense of identity and belonging come into play.

7.1.6 Solutions to challenges of densification

The residents of Kileleshwa estate expressed the opinion that the challenges they are facing as a result of the increased densification of the estate could be alleviated by; improving the water supply system, proper planning and development of the area by the City Council of Nairobi,

upgrading the road network, upgrading the sewer system, better service provision by the City Council of Nairobi, creating stalls for traders, more police patrols and proper development control enforcement.

7.1.7 Benefits of densification to Kileleshwa estate

The densification of the Kileleshwa estate despite the many challenges mentioned in the previous sections has brought some benefits to the residents that are being experienced within the estate. These benefits are; increased housing provision, increased customers for business, improved transport services, increased investments in the area, high property values, improved business opportunities, improved social interactions and creation of employment opportunities.

7.2 RECOMMENDATIONS

7.2.1 Specific recommendations for Kileleshwa

7.2.1.1 Enhancing development control

It is proposed that the CCN should enhance development control as a tool for planning, in Kileleshwa estate and others similar estates in the city. In this context, zoning requirements such as ground coverage, floor limit and minimum plot size, should be strictly adhered to and the zoning policies should explicitly define every detail involved with such guidelines so as to prevent any loopholes for misinterpretation and manipulation.

7.2.1.2 Preparation of local physical development plans

Pursuant to the Physical Planning Act (Cap 286) a local physical development plan should be prepared for Kileleshwa estate. The envisaged strategic aim of the local physical development plan is to provide a detailed spatial framework for land use in the area, with a general objective of encouraging orderly developments on designated areas. The efforts to divide the former larger zone 4 into sub-zones is highly commended, these sub-zones should now be equipped with planning personnel who will be permanently stationed in the sub-zones to monitor, control and coordinate development.

7.2.1.3 Social amenities

During the field surveys, the study noted the absence of public health facilities in the Kileleshwa estate and its immediate environs. It is on this basis that the study proposes the setting up of a public health facility in the Kileleshwa area. This will also contribute towards decreasing traffic

congestion as trips generated due to accessing public health facilities outside the estate will be reduced.

7.2.1.4 Decentralisation of development control processes

There is need to decentralize development control processes within the city of Nairobi, this should be seen as a strategy for enhancing development control. Presently the responsibility for plan approval including site visits by the council's authorities is directly organized from city hall. The study therefore recommends that the city council deploy and provide offices to planning officers within the various sub-zones as created by the 2005/2006 policy review. Since Kileleshwa estate mainly falls within sub-zone 4D, all matters pertaining planning within this zone should be handled by the sub-zone planning offices. Through this strategy development control is likely to be enhanced, planning will be taken closer to the people and reduce time spent in approving development plans at city hall.

7.2.1.5 Expansion and maintenance of the capacity of existing infrastructure

It is proposed that the existing infrastructure in Kileleshwa estate should be expanded to reflect the rapid population increase. Water and sewer reticulation systems should be expanded by replacing existing water and sewer pipes with those of appropriate dimensions to deliver the required volumes; together with this more dams and water treatment plants should be constructed to improve the capacity of existing facilities.

The council should also strongly consider the introductions of either levying direct or indirect capital apportionment on the developers for the purposes of water and sewer infrastructure expansion. These direct apportionments should involve the council at the time of plan approval as an approval condition the developers should be compelled to upgrade the water and sewer infrastructure to serve the proposed development. The indirect apportionment should entail the council taxing the proposed developer and creating a fund for the expansion of the infrastructure.

7.2.1.6 Transport and circulation system

The study identified Ring road Kileleshwa, Manderu road, Gatundu road, Nyeri road and Othaya road as roads that form a major transportation corridor within the Kileleshwa estate, to other neighbouring estates and the CBD, but lacking capacity to handle the increasing traffic volumes. It is therefore recommended that these roads should be made into dual carriage ways to

accommodate the anticipated increase in traffic volumes due to new development. It was noted that the Kileleshwa estate was underserved in terms of the provision of bus stops, it is hereby recommended that bus stops be introduced at strategic points and pedestrian crossings be established to make public transport safer.

Parking in the service centres should catered for in line with the exciting city council by –laws, plans for serviced apartments, restaurants and comprehensive residential development. These developments must provide for either basement or on site parking before the development plan may proceed for approval and implementations.

7.2.1.7 Secondary commercial centres

It is hereby recommended that there be identified within the Kileleshwa estate secondary commercial centres especially for low order goods to curb the emergence of kiosks, shops and other retail activities in primary streets, secondary and residential property boundary walls.

7.2.1.8 Open spaces

The Kileleshwa estate completely lacks public open spaces; the only public open spaces are the road reserves that have also been invaded by various informal commercial activities. It is hereby recommended that the CCN should make deliberate efforts to provide open spaces within the estate either through purchase of land for such purposes or through any other legal means as provided for within the law.

7.2.2 General recommendation

7.2.2.1 Environmental impact assessment

It is proposed that; all proposed developments within the Kileleshwa estate, which are likely to have adverse negative impacts on the environment should be subjected go to an Environmental Impact Assessment (EIA) in accordance with the provision of the Environmental Impact Assessment Regulations of 2003. This proposal should be enforced by NEMA in conjunction with the City Council of Nairobi.

7.2.2.2 Multi-sector partnership

Capital intensive projects should not be dominated by the public sector alone yet there are a member of private institutions and organizations which can be integrated to complement the

public sector especially local authorities in areas such as infrastructure, service development and maintenance. The Kenyan Government and City Council of Nairobi should make deliberate efforts to form partnerships with the private sector in infrastructure provision.

7.2.2.3 Public transport

The City Council of Nairobi, the private sector and other stakeholders in the transport sector should work together towards formulating an affordable and efficient public transport system for the entire city of Nairobi. Measure should be put in place to ensure that public transport becomes the preferred mode of transport as opposed to the private car which many studies have shown to be the cause of the traffic congestion in many cities world over.

7.2.2.3 Rain water harvesting

The Nairobi region is well endowed with adequate rainfall as discussed in earlier sections, but when it rains the rain water goes to waste without being put to any meaningful use. It is hereby proposed that all developers' country wide should be compelled to incorporate aspects of rain water harvesting in all their designs. This water could be utilised in toilets flushing system, watering gardens, washing cars, construction and other outdoor requirements such that the overall demand on the water systems is reduced. Such a reduction would go a long way into reducing water supply problems in the city and the whole country in general.

7.2.2.4 National sewer network

The sewer systems in all urban centres in Kenya are the responsibility of municipalities; yet it is known that they cannot finance such expensive projects due to their perennial cash flow problems. Other similar infrastructures like water and roads have ministries that are dedicated to their course and get funding from the national budget.

It is hereby recommended the formation of a Ministry of Sewer and Sanitation whose mandate will be the development of a national sewer system to cover the whole country. This will include a national budgetary allocation to this ministry for the realisation of its mandate i.e. to establish a national sewer system that municipalities will connect into. The responsibilities of municipalities will be to construct the missing links to join into the national system and to form the network in their respective areas of jurisdiction such that every estate/neighbourhood has a municipal sewer line within its vicinity. The missing links from this point onwards would be put in place by

developers and property owners who would finance the final connection of their developments to the municipal sewer system.

7.3 POLICY ISSUES

7.3.1 *Spatial structure of cities*

The spatial structures of cities are very complex. It is the physical outcome of the subtle interactions over centuries between land markets, topography, infrastructure, regulations, and taxation. Spatial aspects of urban development can have important impacts on economic efficiency and on the quality of the urban environment. However, the evolution of urban form, shaped by the complex interaction between market forces, public investment and regulations, is not often monitored. Consequently, the significant inefficiencies due to a poor spatial structure are often ignored until it is too late to do anything about it. On the other hand, progressive and well functioning municipal urban planning departments can use spatial indicators to regularly monitor urban development and to propose regulatory or public investment action when necessary.

In market economies, municipalities can influence the shape of urban development, not through direct design, but by implementing a coherent and consistent system of land use regulations, infrastructure investments, and land related taxes. However, in the long run, the shape of a city will depend on the way the real estate market reacts to the incentives and disincentives created by these regulations, infrastructure investments and taxes. Because external economic conditions are continuously changing and are unpredictable in the long term, the planning department of municipalities should constantly monitor the evolution the urban spatial structure, and adjust eventually the balance and nature of regulatory incentives and disincentives.

Dense contiguously urbanized and dominantly mono-centric cities are favourable to mass transit and may significantly reduce trip length and as a consequence the total amount of pollutants emitted by transport. However, in the absence of adequate traffic management in the central parts of cities, the concentration of pollution might be higher in dense dominantly mono-centric cities. Dense mono-centric cities have typically higher land prices and therefore tend to reduce the housing floor space and land consumption of the poor while they tend to provide better and cheaper access to most of the jobs.

Planner posse three tools to influence city shape:

- a) Land use regulations,
- b) Infrastructure investments
- c) Taxation

However, to be able to use these tools coherently, clearly established objectives must have been formulated by elected officials.

While the responsibility for most of the above rest with the local government, the central government have a responsibility in providing objectives and guidelines to lower level of government. This is particularly important, as the spatial impact of many local government decisions is not always known. The possible action at the various level of government is tentatively described below:

i) Central government

- Formulate spatial objectives, monitor indicators linked to overall spatial compliance, initiate studies; audit regulations and financial practices that distort spatial structure of cities
- Financing of bulk infrastructure and mass transit investments
- Review of government enterprises land holdings to release on the market any underused or unused land.

ii) Municipalities

- Audit of municipal land use regulations to make explicit their spatial bias
- Promoting new residential product implemented and financed by the private sector.
- Road and transit investments
- Investments around transport hubs, in particular increasing accessibility and security around transit stations
- Network of pedestrian pathways leading to transport stations

7.3.2 Availability of land in cities

Land is becoming increasingly scarce, so it is clearly important to find ways of economizing on land where possible, especially if this can be done without reducing the quality of the urban

environment. More efficient land use would reduce not only the direct cost of land in projects but also the cost of providing and maintaining urban infrastructure.

The search for more efficient land use can be pursued at two different levels. First, it is necessary to address regulatory authorities (urban planning department, development agencies, municipalities, etc.) to assess the combined cost of existing regulations and to devise a more affordable mix of regulations. Second, it is necessary to pursue opportunities for greater efficiency at the project design level.

The most valued commercial locations are usually those which are most accessible. This is true within individual neighbourhoods as well as on a city-wide level. In many planned developments it is assumed that the most accessible area would be in the middle of a development, but in fact this is seldom the case. Because people do not normally pass through the centres of their communities, commercial facilities which are located there are typically underutilized.

Shopkeepers would often prefer to locate their shops at intersections, close to bus stops, and along roads with the greatest pedestrian and vehicle traffic, and they are willing to pay to do so. If these preferences are anticipated by planners, the potential value of well located sites can be exploited in the design and pricing of the development. For example, pedestrian movement can be concentrated along one or two streets in a development, thus increasing the commercial value of land along these streets. The value of commercial plots along these streets can be captured for the benefit of the target groups. Although it is frequently argued that commercial establishments should not be placed near roads and intersections with heavy traffic, it is possible to design facilities in order to minimize congestion for example; by using service roads.

Parks and schools usually account for about 80 per cent of public land in developments. Their requirements are different from those of commercial facilities. Parks and schools must be at a reasonable walking distance from the homes of the residents they serve, but unlike commercial facilities, they do not have to be located on the main pedestrian or vehicular streets of the community. Indeed, it is preferable to locate these facilities in areas where the value of land is lowest i.e., away from areas most suitable for commerce and high income plots. In this way the value of well located land can be fully exploited and public land which must be paid for either by the residents or a government agency will have a low value.

In controlling floor area ration, the goal of the planners has been to indirectly limit population densities. It is believed that "excessive" density results in a loss of environmental quality and increased traffic congestion. In addition, higher densities would place greater demands on urban infrastructure, which cities, plagued by weak technical capacities and inadequate tax revenue, feel ill-equipped to provide at appropriate levels. For example, while low water pressure and high leakage might be acceptable in a low density neighbourhood, the same pressure and leakage performance might create unacceptable living conditions in higher density areas which may entail grave health consequences. Thus, accepting high densities in central areas requires a commitment to improve the productivity and performance of municipal services, requiring substantial investments in infrastructure.

7.3.3 Population densities

The pattern of population densities is the result of complex interactions between markets forces and investments in transport infrastructure, government regulations, taxes and subsidies. Government regulations, taxes and subsidies have seldom a spatial objective, their impact on densities and spatial dispersion is nevertheless usually important. For instance, the fixing of minimum floor area and land use standards, de facto establishes the cost of land as the dependent variable. Other government actions, such as land use regulations and taxation also contribute to promoting low densities and population dispersion. Low density cities and the dispersion of employment centres make mass public transport inefficient the presence of large number of households commuting to the city centre for work makes the use of mass transit a necessity.

7.4 AREAS FOR FURTHER RESEARCH

This research proposes further research on the possibility of enacting appropriate institutional framework involving Public-Private-Partnership in the sustainable neighbourhood development. This framework should be broad based to include shelter and infrastructure (social and physical) provision along side environmental conservation.

7.5 CONCLUSION

The 2005/2006 policy review of planning zones 3, 4 and 5 in Nairobi whose recommendations were later adopted in 2007 by the City Council of Nairobi to guide development in the above mentioned planning zones did not have any impact towards alleviating the challenges that had been brought about by the densification of former low density residential estates especially in the

Kileleshwa estate. The main challenges that were meant to be addressed by the policy review including water shortage, blocked sewer systems and traffic congestion still persist three years after the policy review recommendations were adopted by the CCN.

The residents of Kileleshwa estate are optimistic that the challenges brought about by increased densification of the estate could be alleviated by; improving the water supply system, proper planning and development of the area by the City Council of Nairobi, upgrading the road network, upgrading the sewer system, better service provision by the City Council of Nairobi and proper development control enforcement.

There are also benefits that the densification of the Kileleshwa estate has brought to the residents ranging from; increased housing provision, increased business opportunities, improved transport services, increased investments in the area, high property values, improved social interactions and creation of employment opportunities.

The policy review managed to create planning sub-zones from the former larger planning zones which is a positive step towards decentralisation of planning and development control within the city of Nairobi. Also recommended in the policy review was and is taking shape on the ground is the by-pass and missing road links but it could not be established to what extent the policy review influenced the construction of the by-pass and missing road links.

The densification of low density residential estates through the intensified construction of high-rise residential developments and commercial centres including the Kileleshwa estate where this study was based continues to put pressure on available infrastructure including water systems, sewer systems, storm water drainage and roads; these challenges are likely to increase to levels where the infrastructure will totally collapse if appropriate measures are not put in place.

Densification as a solution to urban sprawl, provision of housing to the urban population or for building compact cities; ought to be preceded by the upgrading of infrastructure together with other social amenities to accommodate the anticipated increased population but should not be used as a strategy to “formalise” developments that already existed on the ground contrary to what previous zoning regulations and guidelines had prescribed for an area.

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