ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

FOR

THE PROPOSED MIXED-USE DEVELOPMENT (COMMERCIAL CUM RESIDENTIAL) AT PARKLANDS/HIGHRIDGE IN WESTLANDS SUB COUNTY OFF IREGI ROAD ON PLOT LR.NO. 209/45/3 (NAIROBI BLOCK 35/127) NAIROBI, LOCATED IN PARKLANDS OFF LIMURU ROAD

NAIROBI COUNTY.

Submitted To:

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

HEAD OFFICE

P.O. BOX 67839- 00200

Nairobi

Submitted on Behalf of:

FOUZAN PROPERTIES LIMITED

P.O BOX 51993-00100

NAIROBI

Submitted By:

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(Registered Firm of Experts – NEMA Reg. No. 11771)

P.O BOX 49141-00100

NAIROBI.

AUGUST 2024

SUBMISSION OF DOCUMENTATION

I ERIC M. MIRITI, on behalf of the EIA Team of Experts and **GEM ENVIRONMENTAL CONSULTING** submit the following Environmental & Social Impact Assessment Report for **THE PROPOSED MIXED-USE DEVELOPMENT AT PARKLANDS/HIGHRIDGE IN WESTLANDS SUB COUNTY OFF IREGI ROAD ON PLOT LR.NO. 209/45/3 (NAIROBI BLOCK 35/127) NAIROBI, LOCATED IN PARKLANDS OFF LIMURU ROAD NAIROBI COUNTY.**

I hereby confirm that to my knowledge, all information contained in this report is an accurate and truthful representation of all findings as relating to the proposed project as per project information provided by the proponent and contractor to the EIA consultants.

Signed in NAIROBI on this ……August……

Signature and stamp:

Designation: **LEAD CONSULTANT AND TEAM LEADER (NEMA Reg. No. 7048)**

SUBMISSION OF DOCUMENTATION

I,……....., on behalf of **FOUZAN PROPERTIES LIMITED** (**PROPONENT**) submit this Environmental and Social Impact Assessment for **THE PROPOSED MIXED-USE DEVELOPMENT AT PARKLANDS/HIGHRIDGE IN WESTLANDS SUB COUNTY OFF IREGI ROAD ON PLOT LR.NO. 209/45/3 (NAIROBI BLOCK 35/127) NAIROBI, LOCATED IN PARKLANDS OFF LIMURU ROAD NAIROBI COUNTY.**

To my knowledge, all information contained in this report is an accurate and truthful representation of all findings as relating to the proposed project and as per the project description provided to the EIA consultant.

Signed in NAIROBI on this ……August…….

Signature and stamp ……..

Table of Content

Acronyms

CPR	Comprehensive Project Report
EA	Environmental assessment
EIA	Environmental impact assessment
EMCA	Environmental management and coordination act
EMP	Environmental management plan
EIA	Environmental & Social Impact Assessment
NEMA	National environment authority
NEAP	National environmental action plan
OHS	Occupational health and safety
PVC	Polyvinyl chloride
WSSD	World summit for the sustainable development

Executive Summary

Globalization, urbanization, migration and technological advancements have continued to drive cities forward right from their infant stages, the cyclic processes, growth, through to their renewal and regeneration. More and more people are moving and positioned themselves in cities for business, work, venturing forth and recreation. The demand for residential space development situation in Kenyan (urban areas) has remained under tremendous pressure. Both the government and private sector have had a role to play with the government servicing the land and leaving it to private entrepreneurs to develop. The provision of housing has not kept pace with the said phenomenon.

Environmental Impact Assessment study was carried out for the ***Proposed Residential cum commercial development of (Basement level 2No. Ground floor, mezzanine 2No. and typical 1-22 levels, an office, reception, shop, store, Madrasa, mosque, tenancy area and lift lobby.***

Typical floors 1-22 levels will comprise of one, two, three, four bedroom and five bed duplex apartment. Total number of units are **165No**. A change of user for the proposed development will be acquired at Nairobi City County offices. This EIA report has been undertaken to comply with the Legal requirement stipulated in the Environmental Management and Coordination Act 1999 (Cap 387) and the subsequent Legal supplement of 2003.

Environmental Impact Assessment is a tool for environmental Planning and has been identified as a key component in new project implementation. According to section 58 of the Environmental Management and Coordination Act (EMCA) No. 8 of 1999) (CAP 387) second schedule 9 (1), and Environmental (Impact Assessment and Audit) Regulation, 2003, new projects must undergo Environmental Impact Assessment. The Report of the same must be submitted to National Environment Authority (NEMA) for approval and issuance of relevant certificates. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

CHAPTER ONE

PROJECT BACKGROUND

1.1 Introduction: Project Background

Housing market in Kenya has recently become one of the most lucrative businesses, many development companies and individuals are now putting up modern housing units for rental and sale, this has become possible by the many banks and financial institutions which are now offering loans and mortgages to both developers and home buyers at subsidized rates. The proposed residential development is privately owned. This is in line with the government of Kenya Big 4 Agenda on affordable housing. The Architectural and structural drawings for the proposed structure have been submitted for approval to the Nairobi county Government. The change of use has been obtained. The report gives in detail the project background, its goal and objectives, scope, project justification and cost, baseline information, Policy- legal and institutional framework governing the exercise, identification of impacts and their respective mitigation measures, a clear description of the project's alternatives and a comprehensive environmental management plan to avert or minimize the anticipated impacts.

1.2 Principal of Environmental & Social Impact Assessment

The fundamental principle of the EIA is that every person is entitled to a clean environment and that every person has a duty to enhance and safeguard the environment. EIA is a planning tool which presents methodologies and techniques for identifying, predicting and evaluating potential environmental impacts of the projects, policies, plans and programmes in the project cycle (planning, implementation and decommissioning phases). EIA presents decision with the information necessary to determine whether or not a project should be implemented.

1.3 Terms of Reference for the EIA Project Report

The terms of reference for the preparation of an EIA Project Report are usually but not limited to: -

- A decisive look at objectives of the project.
- The proposed location of the project site.
- Description of the baseline information, national environmental legislative and regulatory framework, and any other relevant information related to the project.

- Assessment of the technology, procedures and processes to be used, in the implementation of the project.
- Assessment of materials to be used in the construction and implementation of the project and their sources.
- Evaluation and analysis of the anticipated potential environmental effects which are categorized into physical, ecological/biological and socio-economic aspects; this can be further classified as direct, indirect, cumulative, irreversible, short-term and long-term effects.
- Evaluation of the products, by-products and wastes to be generated by the project.
- To recommend a specific environmentally sound and affordable solid waste management system
- Evaluation and analysis of alternatives including the proposed project, project alternative, project site, design and technologies.
- An Environmental Management Plan (EMP), proposing the measures for eliminating/minimizing or mitigating adverse impacts on the environment. `
- Propose measures to prevent health and safety hazards and to ensure security in the working environment for the employees, residents and for the management in case of emergencies. This encompasses prevention and management of the foreseeable accidents and hazards during both the construction and occupational phases.
- Any other matters which may be required by NEMA.

This project report provides relevant information and environmental considerations on the project proponent's intention to seek approval from NEMA for the construction of the proposed project.

1.4 Objectives of the EIA Project Report

The overall objective of this Environmental Impact Assessment project report is to ensure that environmental concerns are integrated in all developmental activities of this particular project. It aims at identifying the potentially effects and risks of the proposed project, evaluating and

suggesting mitigation measures for the significant negative impacts through a comprehensive Environmental Management Plan.

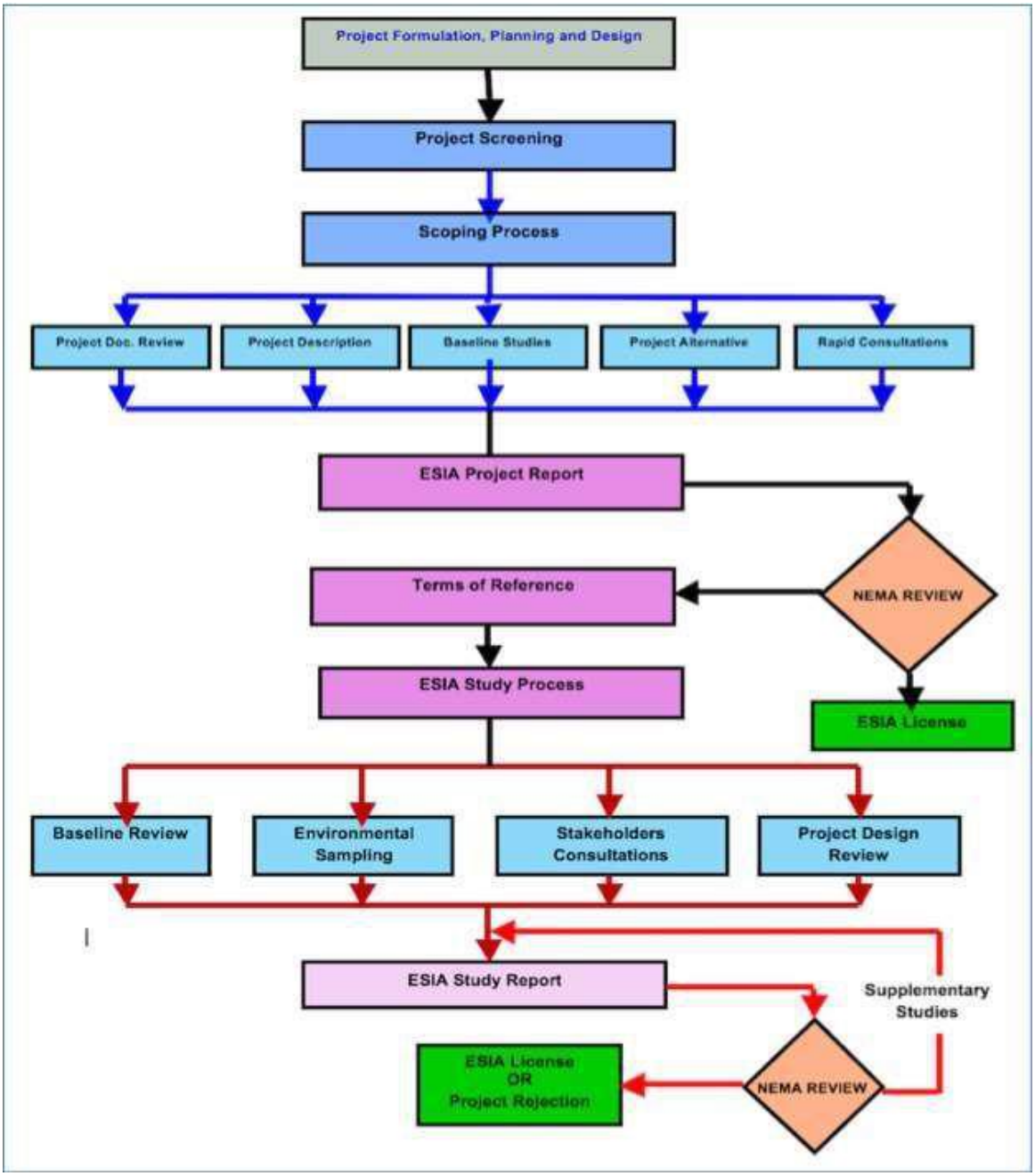


Figure 1: EIA implementation Framework

1.5 The Project Scope

The extent of the project involves a comprehensive environmental assessment that generated environmental concerns in all phases of the project. This task involved: -

- Assessment of the potential Environmental Impacts of the project on the site and the surrounding areas.
- To identify the significance of these impacts.
- To propose the mitigation measures for the anticipated negative impacts to the environment.
- To generate baseline data for monitoring and evaluation of how well the mitigation measures are being implemented during the project cycle.
- To assess the importance of the impacts of alternative sites.
- To present information on the impacts of the alternative sites.
- A review of the environmental policy, legal and administrative framework.
- Social repercussions of the development within the locality and region.
- Development of an Environmental Management Plan with mechanisms for monitoring and evaluating the compliance and environmental performance.

1.6 Method and Criterion Used in the Report

Several methods were employed to gather and compile data during the process of EIA project report making, these include: -

- Site visits to gather raw data on condition of the site and its surrounding.
- Use of self-administered questionnaires.
- Secondary data collection: This involved study of various publications to gather data especially the legal guidelines governing this type of project.
- Analysis of activities to be carried out in the implementation process and their possible anticipated impacts.
- Experts view on the impacts of the project.

The process was also guided by the recommendations from various legally established bodies like the Nairobi county Government, Physical Planning office and various government ministries and agencies.

1.7 Justification

Several factors were considered as valid reasons why the proposed development should be implemented on this particular site, this were either in form of demand for the services or the available infrastructural facilities to support this type of development or the little impact the project will have to the environment. Some of the validating factors considered include: -

i. **Proper utilization of land: -** Construction of the proposed development will put this piece of land into a more profitable and economical use, It was occupied with one single dwelling unit.

ii. **Accessibility.** The accessibility to the site is good; the site is located at Fifth Avenue Parklands off Limuru road, near Agah Khan Hospital. With the booming development of similar residential apartments within the neighborhood, the developers will provide quality housing units and service the streets connecting the various residential units in the neighborhood.

iii. **Sewer System.** This area is connected to a functional sewer from the Nairobi City County. The site will also have a decent washroom which will be utilized by the site workers during the implementation phases. This project does not pose any danger of human waste disposal to the environment.

iv. **Surface run -off.** Water from the roofs of the proposed developments will be harvested into a collection tank; this will not only increase the water stock in this area where water is scarce but also prevent any damage which may be caused by the roof waters. There will also be open drains to cater for drainage from the paved areas.

v. **Solid Waste Management.** Some solid waste will be generated from the site during construction. The main solid waste will include the following:-

   - ✓ Vegetation materials which will be cleared from the site. This will be very minimal since the site is not heavily inhibited by vegetation. The area to be

occupied by the project does not have mature trees and thus the little vegetation cleared from it will not have any significant impact to the environment.

- ✓ Concrete materials and pieces of masonry blocks during demolition of existing block
- ✓ Pieces of wood and metal bars.
- ✓ Material wrappings and un-used wooden boxes.

All waste generated during the implementation phase will be disposed off suitably into the approved dumpsites. A plan to handle all waste has been included in the Environmental Management Plan. **(***Refer to the EMP Table***)**

vi. Security. Security will be provided at all times (day and night) at all phases of the project; this will ensure the security of materials, operators and equipment on site. The site will also be fenced using a concrete perimeter wall and have day and night guards as a measure of boosting security.

CHAPTER TWO

PROJECT DESCRIPTIONS, DESIGN & CONSTRUCTION

2.1 Introduction

The overall objective of this project is to develop a residential flat of 22 levels along Iregi road-Parklands few meters from City market within Nairobi County on plot 209/45/3 (NAIROBI BLOCK 35/127). The proposed project will lead to conversion of single dwelling to multi-use residential flat. This will contribute towards growth of the area which is currently experiencing an acute shortage of such facilities, and it's in line with the Big 4 agenda. The project will also create several employment and business opportunities in addition to the several positive impacts discussed in this report. The site falls within a residential area with several upcoming residential developments including a road network, electricity supply and other infrastructure. The area lies at a latitude of **-1.256488** and longitude of **36.821410**

Detailed project description

The main design components of the project include, but not limited to the following:

- Construction of the 165No. apartments
- Guard house
- Commercial center,
- Reception
- KPLC room
- Management office
- Reception
- Lobby area,
- 2No. Lifts
- Connection to county sewer
- Parking bays
- Refuse room
- Cafeteria

Number of apartments will comprise the following:

5 Bed Duplex apartments 11No.

4 Bed apartments 66No.

3 Bed apartments 22No.

2 Bed apartments 44No.

1 Bed apartments 22No.

2.2 Electrical system

There will be connection to the existing electricity main line of the Kenya Power and Lighting Company, which will be used in all phases of the project. The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to. There is a proposed KPLC room to supply electricity to the residential development.

2.2.1 Water Reticulation system

Water from private suppliers will be used during construction and operation phases. More over there will be water storage tanks to increase water supply to various components of the construction. The client plans to get water from Nairobi water and sewerage company piped water on site and can also consider rain water harvesting to improve on water supply upon occupation. If need be borehole shall be drilled to supplement the county water.

2.2.2 Sewerage

The area has an existing sewer line. The proposed development will use a sewer line for the disposal of liquid waste. The manhole will be checked regularly to improve on its operation.

2.2.3 Solid Waste

Solid waste management will consist of dustbins stored in cubicles protected from rain and animals. The waste will then be collected by a NEMA licensed private waste management company and be composited, palletized or re-cycled depending on the waste management strategy to be adopted in line with the Environmental Management and Co-ordination (Waste Management) Regulations, 2006.

2.2.4 Perimeter Fence

A concrete perimeter wall will be erected around the project site later on after the construction of the residential flat.

Security

There will be the main entrance for easy security operations around the compound, a boundary wall connected with security alarms, entry control around the court.

2.2.5 Landscaping

The site will be landscaped after construction, using plant species available locally. This will include establishment of flower gardens and lush grass lawns to improve the visual quality of the site where pavements will not have taken space.

2.2.6 Buildings Construction

The technology used in the design and construction of the house will be based on international standards, which have been customized by various housing units in Kenya. The building will be constructed as per the respective structural engineer's detail as provided for in the drawings presented in the Appendix. Basically, the building structures will consist of concrete appropriately reinforced with metal (steel and iron). The roof will consist of structural timber and steel members and roofing tiles. The building will be provided with a well-designed concrete staircase. The building will be provided with facilities for drainage of storm water from the roof through peripheral drainage systems into the drainage channels provided and out into the natural drainage channel/system. Drainage pipes will be of the PVC type and will be laid under the buildings and the driveway encased in concrete. This is a sparsely build area and such no need for public drainage channel. The building will have adequate natural ventilation through provision of permanent vents in all habitable rooms, adequate natural and artificial light, piped water stored in above ground water tanks and firefighting facilities.

2.3 Project Implementation

2.3.1 Preconstruction phase

This involves study of the project area, design of the construction drawings and getting approvals for the same from the respective Local authority, NEMA, Physical Planning, County lands officer and any other relevant authority. Soil tests are also done at this stage, soil tests provide the bearing capacity of the soil thus determining the type of foundation to be laid.

2.3.2 Site Construction

The construction of the single unit dwelling will be based on applicable international building standards. Other building standards including the Building Code and the British Building Standards which include BS 8110, BS 5950, BS4449, BS4461 will be incorporated. The constructions will as well incorporate environmental guidelines, health and safety measures.

Implementation activities include the following: -

Site clearing and Excavation of the Foundations and Space for Underground Foundations: This entails removal of unwanted vegetation from the site and excavation of the projects' foundations. The few shrubs on the site will be cleared to pave way for excavation activities; the excavation of the site will not involve much machinery since the soil on site is light and well drained.

Civil works: Civil works involves: -

- Procurement of construction materials from approved dealers.
- Transportation of construction materials to the site and disposal of the resulting flora waste using light machinery.
- Storage of the construction materials.
- Laying and construction of the foundations.
- Disposal of the existing debris/ materials.

Electrical works: Electrical works involve installation of the Power Distribution Box, control panel, and all power supplying cables and equipment. All electrical works are done by qualified electricians so as to avoid faulty connections which may later cause fire outbreaks and short circuiting of the site equipment.

2.4 Construction Inputs (Materials and Equipment)

The project inputs include the following:-

Construction inputs/ raw materials: These include i.e. sand, cement, machine cut stones, crushed rock (gravel/ ballast), steel metal bars, paint/painting materials among others. All these will be obtained from licensed dealers and especially those that have complied with the environmental management guidelines and policies.

Construction machines: These include machinery such as trucks, concrete mixers, masonry tools and other relevant construction equipment. These will be used for the clearing of the vegetation, transportation of raw materials and the resulting construction debris. Most of the machinery will use diesel or petrol energy as a source of power.

Labour force: Both skilled and non-skilled workers will be required at all phases of the project. The labour force will require services such as energy, water supply and sanitation facilities. Large volumes of water will also be required during the civil works.

2.5 Project Outputs

There will be little waste generated from the proposed project; this is due to the nature of the materials used and the magnitude of the project. Most of the waste materials generated will be re-used while the non-reusable waste will be disposed off in the appropriate manner as described in the management plan illustrated in this report. Some of the anticipated waste materials include pieces of Wood, Papers, Empty Tins, Electric cables, Plant materials, pieces of metal rods etc.

Waste will also be generated during the operation phase of the project, the anticipated waste will include:-

- Waste wasters/sewage: This will be directed to a waste water treatment plant.
- Product/material wrappings: These materials will be sorted and disposed off in the appropriate manner. Waste bins will be placed strategically within the compound for dumping this form of waste.

2.6 Public participation

Stakeholder engagement and consultation is a policy requirement by the Government of Kenya and a mandatory procedure as stipulated in the National Constitution and also by EMCA 1999 and EMCA (amendment), 2015 section 58, on Environmental Impact Assessment (EIA) for the purpose of achieving the fundamental principles of sustainable development. This section describes the process of stakeholder engagement and consultation that will be followed to identify the key issues and impacts of the proposed project from the stakeholder's views especially the project affected people (PAPs) near the proposed site.

The consultations were undertaken using a standard questionnaire). This targeted stakeholders (mainly PAPs and relevant institutions) and public barazas

Public participation basically involves engaging members of the public to express their views about a certain project. Public participation tries to ensure that due consideration will be given to

public values, concerns and preferences when decisions are made. Public participation in this project was facilitated through interviews and questionnaires with the Parklands/Westlands Sub-County residents. They however reiterated that more emphasis should be put towards ensuring that the proposed project and its infrastructure will not negatively interfere with the environmental integrity of the surrounding areas especially the access road and waste water management plans

The purpose of public involvement is to:

- Inform the stakeholders about the proposal and its likely effects;
- Canvass their inputs, views and concerns; and
- Take account of the information and views of the public in the EIA and decision making.

2.6.1Objectives of the Stakeholder Engagement and Consultations

The objective of the exercise will be to:

- Disseminate and inform the stakeholders (especially the neighborhood surrounding the proposed site).
- Create awareness among the public on the need for the EIA for the proposed project
- Gather comments, suggestions and concerns of the interested and affected parties.
- Incorporate the information collected in the final EIA study report.
- To share with stakeholders, the impacts (positive and/or negative) that they should expect from the proposed project during construction, installation and operation;
- To seek consensus and stakeholder consent on the project
- Comply with EIA Regulations;
- Comply with the public participation obligation in the National Constitution;
- Obtain wider support from stakeholders for the proposed project;
- Improve communications between the proponent and relevant stakeholders including local administration and county government;
- Enhance proponent corporate reputation; and
- Provide for more sustainable decision-making.

2.6.2 Stakeholder engagement strategy

The overall approach for the stakeholder engagement will be based on the recent guidelines by NEMA on EIA, EA and SEA consultations. The methods used in line with this will include key informant consultations and comprehensive EIA questionnaire as highlighted below:-

a) ***Key informant interviews (KIs***): This involved key informant consultation of the targeted officials in **Table 2.1**. Consultations will either be held virtually or physically (face-to-face) in the official's places of work or through a door to door. These interviews will be conducted using the structured questions in the standard EIA questionnaire.

b) Comprehensive EIA Questionnaire

To ensure a formal record of community views, concerns and/or recommendations regarding the proposed project, a structured standard EIA questionnaire will be administered to all the various clusters of stakeholders in order to capture their individual views with regard to the following attributes regarding the proposed project:-

a) Expectations from the proposed project;
b) The benefits expected from the proposed project;
c) Environmental concerns for the proposed project;
d) Recommendations for addressing environmental concerns;

Overall recommendation on whether the project should be implemented or not.

2.6.3 Stakeholder Identification

Key stakeholders will be identified in accordance with the areas/sectors that are affected directly or indirectly by the proposed Master Plan. The criteria that will be used to identify various stakeholders will be based on the legal mandates of various institutions, assessment of the different interests of the stakeholders, stakeholder power rights and responsibilities and their role in the proposed development in Nairobi County

Stakeholder category/organisation, group or individual	Potential role in the EIA activity	Engagement strategy	Follow-up strategy plans for feedback or continued involvement
Public sector and key local administration/ key public institution	Give views on the project Identify any improvement needed for the plan	Special consultations at the organizational levels Review of any relevant existing documents	Implement the final recommendations Participate in Monitoring and Evaluation of the implementation of EIA recommendations
Private sector actors/ investors and associations	Come up with ideas to improve the plan	Special consultations at the organizational levels	Participate in Monitoring and evaluation of the implementation of EIA recommendations Implement the final recommendations
Political leadership	Play major role in creating awareness on the Master Plan	Invitation of some political leaders to participate in public consultation meetings	Invitation to validation meeting
Civil society organizations (NGOs and CBOs)	Enhance awareness of the Master Plan since they deal with people on the ground	Invitation to participate in scoping engagement	Implement the final recommendations especially on community-related issues
Professional associations/ experts/research and academic institutions	Lead in research and consultancy	Invitation to public meetings One on one consultation	Participate in Monitoring and evaluation of the implementation of EIA recommendations

Table 2.1: List of stakeholders for the EIA process

The focus group consultative meeting took place at the proposed site on 9th August 2024 at around 10am and the public baraza chaired by the area senior chief was held on 17th August 2024 at High-ridge Primary School.

The engagement was successful and the people welcomed the project. However, their major concern was on how they can be directly engaged on such projects to offer labour. Minutes attached herein shows their major concern and how the deliberations to solve or avoid some of the issues raised should be handled by the contractor and the proponent at large.

Plate 1: Consultative meeting

CHAPTER THREE

BASELINE INFORMATION

3.1 PHYSICAL ENVIRONMENT

3.1.1 Climate

At 1,795 meters (5,889 ft) above sea level, Nairobi enjoys a moderate climate. Under the Koppen climate classification, Nairobi has a Subtropical highland climate. The altitude makes for some chilly evenings, especially in the June/July season when the temperature can drop to 10 °C (50 °F). There are two rainy seasons but rainfall can be moderate. The cloudiest part of the year is just after the first rainy season, when, until September, conditions are usually overcast with drizzle. Temperature fluctuates between 15°C and 32°C in most areas

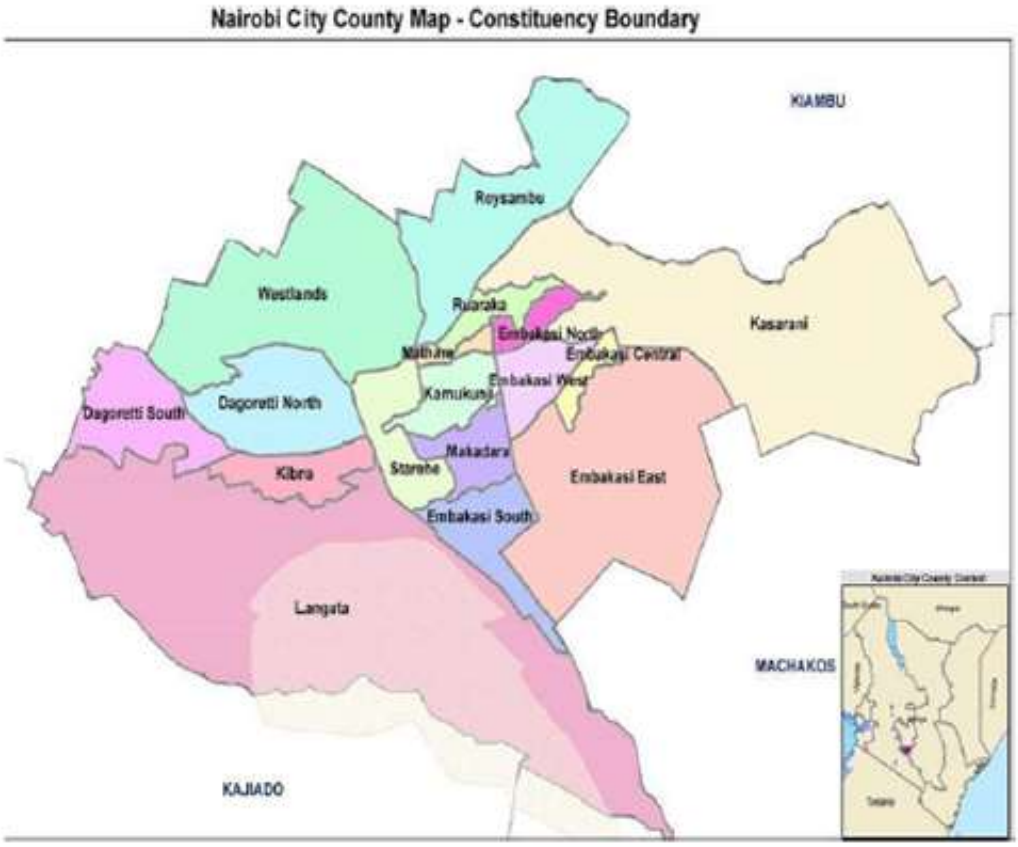


Figure 3.1 shows Nairobi Sub-County

3.1.2 Topography

The site lies at an altitude of about 1795 meters above sea-level. It gradually slopes towards the northern part of the property. The area lies at a latitude of **-1.256488** and longitude of **36.821410**

3.1.3 Geology and Soils

The geology and soils of an area have a great influence on the type of physical development and also determine the type of land use appropriate for the area. The site has generally shallow black cotton soils which are well drained and easy to work on during construction.

3.1.4 Water Resources and Wetlands

Although Nairobi relies mainly on surface water supplies, the sources of these supplies lie outside the city. The surface streams, though numerous, are heavily contaminated by domestic and industrial effluents and solid wastes. Naturally rivers are expected to cleanse themselves as they move downwards, but this is not the case with the Nairobi River and its tributaries, because there are many sources of organic pollution along the river.

3.2 Biological Environment

This section describes key biological elements, including the identification and distribution of dominant, rare and the unique flora and faunal species within the proposed project site and other potentially affected areas.

3.2.1 Flora

Natural vegetation in Nairobi has been cleared to pave way for the establishment of both residential and commercial developments. The natural vegetation in the area has thus been greatly modified. The remnants of the natural vegetation of the site and its environs are few scattered trees and shrubs as well as grass. The site has exotic plants and the proponent is encouraged to do a lot of landscaping to provide greenery and maintain a healthy environment.

3.2.2 Fauna

There are different species of birds and animals such as cows, goats, sheep, and donkey's e.tc.

3.3 SOCIO-ECONOMIC ENVIRONMENT

3.3.1 Land Use

The surrounding area of the proposed project is a residential estate, with maximum activities of construction going on. Schools, churches and residential houses are in place.

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 26 Resource Surveys and Remote Sensing (DRSRS 1994) identified eight major land-use classes in major urban centres in Kenya. These include Residential use Industrial, commercial and service centres, Infrastructure land use, Recreational areas, urban agriculture as well as Water bodies and riverine areas

3.3.1.1 Current Physical Development Planning Policy

There is a physical and local physical development plan and regional physical development plan for the area where the local authority has issued a controlled development of the entire area.

3.3.1.2 Land Uses Adjacent to the Site

The neighborhood, where the proposed development is located is characterized by clustered residential dwelling units (flats), commercial facilities which include shops, institutions, police stations, housing projects, City market and city park arena.

3.4 Baseline noise levels

The average day-time pre-project noise levels in the proposed project site was estimated at 42db which was slightly below the Maximum Permissible Noise Level of 50Db **Table 3-1**. Most of the sound and noise emission was associated with the operation of farm machinery and birdlife in the area.

Table 3- 1: Baseline noise levels for the proposed mixed-use development

Noise levels around the proposed site for Fouzan Properties Ltd- Iregi road, Parklands

Location	GPS	Baseline Noise (dBA) Readings										Min	Max	Ave
		1	2	3	4	5	6	7	8	9	10			
1. Entrance gate No. 1 area	E -1.256573 S 36.821116	54	60	59	65	76	86	54	97	60	99	**54**	**99**	104
2. Entrance gate No. 2 area	E -1.2565412 S 36.8213738	65	68	98	100	102	67	86	54	95	55	**54**	**102**	78
3. Near the parking area	E -1.2565147 S 36.8214746	50	55	59	70	67	89	55	69	83	79	**50**	**89**	70
4. Along the drive way	E -1.2565783 S 36.821482	56	59	67	68	81	54	64	79	88	97	**56**	**88**	72
5. At the neighboring building on the East	E -1.2567416 S 36.8214103	85	89	90	100	79	84	60	79	74	90	**60**	**100**	80
6. Near the plastic water tank	E -1.2568752 S 36.821366	98	89	78	67	89	69	69	89	90	77	**67**	**98**	83
7. At the neighboring building on construction on the western side	E -1.2568297 S 36.821424	102	99	78	97	80	79	100	89	69	75	**69**	**102**	86
8. Center of the property	E -1.2570824 S 36.821518	67	57	68	76	89	85	65	78	87	77	**57**	**89**	73

Some of the noise level were high due to the activities that are going on within the area. Most of the neighboring plots are under construction.

CHAPTER FOUR

RELEVANT ENVIRONMENTAL LEGISLATIVE AND REGULATORY FRAMEWORK

4.1 Introduction

Environmental Impact Assessment is an instrument for environmental management and development control. It is now accepted that development projects must be economically viable, socially acceptable and environmentally sound. It is a condition of the Kenya Government for developers to conduct Environmental Impact Assessment (EIA) on the development Projects. According to Sections 58 and 138 of the Environmental Management and Coordination Act (Cap 387) and Section 3 of the Environmental (Impact Assessment and Audit) Regulations, 2003 (Legal Notice No.101), construction of buildings require an Environmental Impact Assessment project report prepared and submitted to the National Environment Management Authority (NEMA) for review and eventual licensing before the development commences.

4.1 Policy Framework

Environmental policies cut across all sectors and government departments. As such policy formulation should be consultative steered by interdisciplinary committees. Recent policies which the government is working on include; Draft Wildlife Policy; Draft National Land Policy; and Wetlands Management and Conservation Policy among others.

4.1.1 National Environmental Action Plan (NEAP)

National Environmental Action Plan was a deliberate policy effort to integrate environmental concerns into the country's development initiatives/plans. This assumed a consultative and multi-sectoral approach. Such an approach ensured that environmental management and the conservation becomes integral in various decision making platforms. As a result of its adoption and implementation, establishment of appropriate policies and legal guidelines as well as harmonization of the existing ones have been accomplished and/or are in the process of development. Under the NEAP process, Environmental Impact Assessments were introduced targeting the industrialists, business community and local authorities.

4.1.2 National Shelter Strategy to the Year 2022

Kenya adopted this strategy following the International Year of Shelter for the Homeless in 1987. This advocates for the involvement of various actors to come in and assist the government in

providing housing. This took cognizance of the governments' inability to provide sufficient shelter for all its citizens. The government was to simply facilitate other actors such as developers to invest in shelter.

4.1.3 The National Poverty Eradication Plan (NPEP) bill No. 13 of 2020

The objective NPEP is to alleviate poverty in rural and urban areas by 50 percent by the year 2030; as well as the capabilities of the poor and vulnerable groups to earn income. It also aims to narrow gender and geographical disparities and a healthy, better educated and more productive population. This plan has been prepared in line with the goals and commitments of the World Summit for the Sustainable Development (WSSD)

4.1.4 National Policy on Water Resources Management and Development

While the National Policy on Water Resources Management and Development (2006) enhances a systematic development of water facilities in all sectors for promotion of the country's socio-economic progress, it also recognizes the by-products of this process as wastewater. It therefore, calls for development of appropriate sanitation systems to protect people's health and water resources from institutional pollution.

This implies that Industrial and business development activities should be accompanied by corresponding waste management systems to handle the waste water and other waste emanating there from. The same policy also requires that such projects undergo comprehensive EIAs that will provide suitable measures to be taken to ensure environmental resources and people's health in the immediate neighborhood and further downstream are not negatively impacted by the emissions.

As a follow-up to this, EMCA, 1999 (Cap 837) requires annual environmental audits to be conducted in order to ensure that mitigation measures and other improvements identified during EIAs are implemented. In addition, the policy provides for charging levies on waste water on the basis of quantity and quality. The "polluter-pays-principle" applies in which case parties contaminating water are required to meet the appropriate cost of remediation. Consequently, to ensure water quality, the policy provides for establishment of standards to protect water bodies receiving wastewater, a process that is on-going. The standards and measures to prevent pollution

to water resources are provided for in the Environmental Management and Coordination (Water Quality) Regulations, 2006 which is a supplementary legislation to (CAP 387).

National Water Policy, 2021. The overall goal of the policy is to guide the achievement of sustainable management, development, and use of water resources in the country. The overall objective of the policy is to provide a framework that is dynamic, innovative, and effective for re-engineering the water sector.

4.1.5 Policy Paper on Environment and Development (Sessional Paper No. 6 of 1999)

The key objectives of the Policy include: -

- To ensure that from the onset, all development policies, programmes and projects take environmental considerations into account,
- To ensure that an independent environmental impact assessment (EIA) report is prepared for any industrial venture or other development before implementation,
- To come up with effluent treatment standards that will conform to acceptable health guidelines.

Under this paper, broad categories of development issues have been covered that require a "sustainable development" approach. These issues relate to waste management and human settlement. The policy recommends the need for enhanced re-use/recycling of residues including wastewater, use of low or non-waste technologies, increased public awareness raising and appreciation of a clean environment. It also encourages participation of stakeholders in the management of wastes within their localities. Regarding human settlement, the paper encourages better planning in both rural and urban areas and provision of basic needs such as water, drainage and waste disposal facilities among others.

4.2 Legal and Legislative Framework

4.2.1 Environmental Management and Coordination Act No.8 of 1999 (Cap 387)

This project report has been undertaken in accordance with the Environment (Impact Assessment and Audit) Regulations, 2003, which operationalizes the Environmental Management and Coordination Act, 1999. The report is prepared in conformity with the requirements stipulated in

(Cap 387) and the Environmental Impact Assessment and audit Regulations 2003, Regulation 7 (1) and the Second Schedule.

Part II of the said act states that every person is entitled to a clean and healthy environment and has the duty to safeguard the same. In order to achieve the goal of a clean environment for all, new projects listed under the second schedule of Section 58 of EMCA No. 8 of 1999 shall undergo an Environmental Impact Assessment.

The Environment Management and Coordination Act (CAP 387) provides for the establishment of an umbrella legal and institutional framework under which the environment in general is to be managed. CAP 387 is implemented by the guiding principle that every person has a right to a clean and healthy environment and can seek redress through the High court if this right has been, is likely to be or is being contravened. Pursuant to section 25 (4) of EMCA, National Environmental Management Authority (NEMA) is required to restore degraded environmental sites using the National Environmental Restoration Fund.

Section 58 of the Act makes it mandatory for an Environmental Impact Assessment study to be carried out by proponents intending to implement projects specified in the second schedule of the Act which are likely to have a significant impact on the environment. Similarly, section 68 of the same Act requires operators of existing projects or undertakings to carry out environmental audits in order to determine the level of conformance with statements made during the EIA study.

The proponent is required to submit the EIA and environmental audit reports to NEMA for review and necessary action. Section 72 of the Act prohibits discharging or applying poisonous, toxic, noxious or obstructing matter, radioactive or any other pollutants into aquatic environment. According to section 73 of the act, operators of projects which discharge effluent or other pollutants into the aquatic environment are required to submit to NEMA accurate information on the quantity and quality of the effluent. Section 76 provides that all effluent generated from point sources are to be discharged only into the existing sewerage system upon issuance of prescribed permit from the local authorities.

Section 87 (1) makes it an offence for any person to discharge or dispose of any wastes, whether generated within or outside Kenya, in such a manner as to cause pollution to the environment or ill health to any person. The proponent will have to ensure that environmental protection facilities

or measures to prevent pollution and ecological deterioration such as sewerage connections, solid waste management plans, and landscaping and aesthetic improvement programme are implemented and maintained throughout the project cycle. As well the; proponent will have to ensure that appropriate measures to prevent pollution of underground and surface water are implemented throughout the project cycle.

4.2.2 The Environmental Management and Co-ordination (Waste Management Regulations 2022) Legal Notice No. 121: Section 4-6

Part II of the Environmental Management and Co-ordination (Waste Management) Regulations, No. 31 of 2022 states that:-

Section 4

1) No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle.

2) Any person whose activities generate waste shall collect, segregate and dispose or cause to be disposed off such waste in the manner provided for under these Regulations.

3) Without prejudice to the foregoing, any person whose activities generates waste has an obligation to ensure that such waste is transferred to a person who is licensed to transport and dispose off such waste in a designated waste disposal facility.

Section 5

(1) A waste generator shall minimize the waste generated by adopting the following cleaner production methods

a. Improvement of production process through:-

- Conserving raw materials and energy;
- Eliminating the use of toxic raw materials; and
- Reducing toxic emissions and wastes

b. Monitoring the production cycle from beginning to end by:-

- Identifying and eliminating potential negative impacts of the product;
- Enabling the recovery and re-use of the product where possible;

- Reclamation and recycling

4.3 Physical Planning Act, 2019

The said Act section 29 empowers the local Authorities (Now County Governments) to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section allows for prohibition or control of the use and development of an area. Section 30 state that any person who carries out development without development permission will be required to restore the land to its original condition. It also states that no other licensing authority shall grant license for commercial or industrial use or occupation of any building without a development permission granted by the respective local Authority. The proponent has obtained change of user

4.4 Building Code 2020

The draft National Building Code, 2020, developed by the Ministry of Transport, Housing and Public works seeks to prevent buildings from collapsing and save lives and property.

A person who erects a building or develops land or changes the use of a building or land, or who owns or occupies a building or land shall comply with the requirements of these by- laws. For the purpose of this by- laws and the following operations shall be deemed to be the erection of a building:-

a) The alteration or extension of a building.

b) The changing of the use or uses to which land or building is put.

c) The formation or lying out of an access to a plot.

Section 194 requires that where sewer exists, the occupants of the nearby premises shall apply to the local authority for permit to connect to the sewer line and all the wastewater must be discharged in to sewers. The code also prohibits construction of structures or building on sewer lines.

4.5 The Electricity Power Act, 1997

Section 55 (1) in the execution of works in connection with the construction, modification, maintenance or operation of an electric supply line or apparatus or conductor connected thereto, every licensee shall:-

In no way injure the works, conveniences or property belonging to any such other such authority, company or person, nor obstruct or interfere with public traffic, except with the previous consent of the board.

4.6 The Penal Code (Cap. 63)

Section 191 of the Penal Code makes it an offence for any person or institution that voluntarily corrupts, or foils water for public springs or reservoirs rendering it less fit for its ordinary use. Similarly, section 192 of the same act prohibits making or vitiating the atmosphere in any place to make it noxious to health of persons/institution in dwellings or business premises in the neighborhood or those passing along a public way.

T*he proponent will be required to ensure strict adherence to the Environmental Management Plan throughout the project cycle in order to mitigate against any possible negative impact.*

4.7 The Occupational Safety and Health Act, 2007

This is an act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes. The Act was published in the Kenya Gazette Supplement No. 111 (Acts No.15). It received presidential assent on 22nd October, 2007 and became operational on 26th October, 2007. The key areas addressed by the Act include:

- General duties including duties of occupiers, self-employed persons and employees
- Enforcement of the act including powers of an occupational safety and health officer
- Registration of workplaces.
- Health General Provisions including cleanliness, ventilation, lighting and sanitary conveniences
- Machinery safety including safe handling of transmission machinery, hand held and portable power tools, self-acting machines, hoists and lifts, chains, ropes & lifting tackle,

4.8 Environmental Vibration Pollution (Control) Regulations, 2009

These regulations were published as legal Notice No. 61 being a subsidiary legislation to the Environmental Management and Co-ordination Act, 1999 (Cap 387). The regulations provide information on the following:

i. Prohibition of excessive noise and vibration

ii. Provisions relating to noise from certain sources

iii. Provisions relating to licensing procedures for certain activities with potential of emitting excessive noise and/or vibrations and

iv. Noise and excessive vibrations mapping.

According to regulation 3 (1), no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment.

4.9 County Environment Committee

County Environment Committees are responsible for the proper management of the environment within the County in respect of which they are appointed to. They are also to perform such additional functions as are prescribed by the Act or as may, from time to time be assigned by the Minister by gazette notice. The decisions of these committees are legal and it is an offence not to implement them.

4.10 Public Complaints Committee

The Committee is charged with the following functions:

Investigating allegations/ complaints against any person or against the Authority (NEMA) in relation to the condition of the environment and its management, Prepare and submit to the County periodic reports of its activities which shall form part of the annual report on the state of the environment, and to perform such other functions and excise such powers as may be assigned to it by the County.

4.11 Water Act, 2016

An Act of Parliament to provide for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services; to repeal the Water Act (Cap. 372) and certain provisions of the Local Government Act; and for related purposes (ACT NO. 8 OF 2002).

4.12 Wayleaves Act Cap 292

This Act makes provision for wayleaves in favor of the Government on private lands for purposes of carrying out of public works and for the protection of such works on any lands. The term "private land" does not include any land sold or leased under any Act dealing with Government lands. The Government shall notify in advance the owner of land, of its intention to carry any sewer, drain or pipeline into, though, over or under any private land without the consent of the owner. If any owner, lessee or occupier of affected private land objects to the intended work and notifies such objection to the competent District Commissioner, the intended work shall not be initiated without the sanction of the Minister.

4.13 Registration of Titles Act Cap 281

Section 34 of this Act states that when land is intended to be transferred or any right of way or other easement is intended to be created or transferred, the registered proprietor or, if the proprietor is of unsound mind, the guardian or other person appointed by the court to act on his/her behalf in the matter, shall execute, in original only, a transfer in form F in the First Schedule, which transfer shall, for description of the land intended be dealt with, refer to the grant or certificate of title of the land.

CHAPTER FIVE

IMPACT IDENTIFICATION, PREDICTION & EVALUATION

5.1 Description of the Existing and Anticipated Impacts

5.1.1 Existing Impacts

There are no existing environmental concerns on the site and the surrounding area. The site has no vegetation of value; only grass which is covering the site will be cleared for the new development.

5.1.2 Anticipated Impacts

Impacts can either be positive or negative, direct or indirect. The magnitude of each impact is described in terms of being significant, minor or negligible, temporary or permanent, long-term or short-term, specific/localized or widespread and reversible or irreversible.

5.2 Positive Impacts of the Proposed Project

The proposed development will have numerous positive impacts to the area residents and to the general area. Some of the anticipated benefits include:-

5.2.1 Provision of Housing Unit

The rate of urban sprawl has and continues to increase in Kenya today; this has been aggravated by increase in population as a result of natural growth or as a result of urban-rural migration. The proposed project will therefore address the housing needs.

5.2.2 Creation of Employment Opportunities

Several employment opportunities will be created for construction workers during the construction phase of the project and operators during the operation phase of the project. This will be a significant impact since unemployment is currently quite high in the country in general.

5.2.3 Provision of Market for Supply of Building Materials

The project will require supply of large quantities of building materials most of which will be sourced locally and from the surrounding areas. This provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals with such materials.

5.2.4 Increased Business Opportunities

The large number of project staff required provides ready market for various goods and services, leading to several business opportunities for small-scale traders such as food vendors around the construction site.

5.3 Negative Impacts of the Proposed Project

There are a few negative impacts anticipated from the proposed project, these negative impacts however are not major enough to cause any major impact to the environment. They are also few compared to the anticipated positive impacts. The anticipated negative impacts include: -

5.3.1 Increased Soil Erosion

Land and excavation works will lead to increased soil erosion at the project site and release of sediments into the drainage systems and ultimately into water bodies. Uncontrolled soil erosion can have adverse effects on the local water bodies such as sedimentation, introduction of nutrients into the water bodies, de-coloration of water affecting the penetration of sunlight into the water.

5.3.2 Solid gaseous and liquid Waste Generation

The three forms of waste will be generated at the site during construction and operation phases of the project infrastructure. Such waste will consist of metal cuttings, rejected materials, surplus materials, spoilt, excavated materials, waste oils and grease, pieces of tryes, paper bags, empty cartons, empty paint and solvent containers, broken glass among others.

Such solid waste materials can be injurious to the environment through blockage of drainage systems, choking of water bodies and negative impacts on human and animal health. This may be accentuated by the fact that some of the waste materials contain hazardous substances such as oils and grease, paints, cement, adhesives and cleaning solvents, while some of the waste materials including metal cuttings and plastic containers are not biodegradable and can have long-term and cumulative effects on the environment. They also pose danger to the safety of the public in case of accidental cutting or injury.

5.3.3 Extraction and Use of Building Materials

Building materials such as hard core, ballast, cement, rough stone and sand required for construction of the project will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. Since substantial

quantities of these materials will be required for construction of the project, the availability and sustainability of such resources at the extraction sites will be negatively affected, as they are not renewable in the short term. In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, removal of vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health risks and associated impacts.

5.3.4 Dust Emissions

During construction, the project will generate substantial quantities of dust at the construction site and its surrounding. The sources of dust emissions will include leveling works, excavation and to some extent, transport vehicles delivering building materials. Emission of large quantities of dust may lead to significant impacts on construction workers and the local residents, which will be accentuated during dry weather conditions.

5.3.5 Exhaust Emissions

The trucks used to transport various building materials from their sources to the project site will contribute to increases in emissions of $C0_2$, NO and fine particulate along the way as a result of diesel combustion. Such emissions can lead to several environmental impacts including global warming and adverse human health impacts, the same can be experienced from the vehicles visiting the facility. Because large quantities of building materials are required, some of which are sourced outside the site area, such emissions can be enormous and may affect a wider geographical area. The impacts of such emissions can be greater in areas where the materials are sourced and at the construction site as a result of frequent gunning of vehicle engines, frequent vehicle turning and slow vehicle movement in the loading and offloading areas.

5.3.6 Noise and Vibration

The construction works, delivery of building materials by heavy trucks and the use of machinery/equipment including generators, metal grinders and concrete mixers will contribute high level of noise and vibration within the site and the surrounding area. Elevated noise levels within the site can affect project workers and the residents, passers-by and other persons within the vicinity of the project site.

5.3.7 Risks of fire Accidents and Injuries to Workers

Because of the intensive engineering and construction activities including erection and fastening of roofing materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others. Fire accidents are also prone in such a facility, proper care should be taken during implementation and operation phases of the project.

5.3.8 Energy Consumption

The project will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability. Combustion of fossil fuels in engines leads to production of carbon dioxide, a greenhouse gas, associated with global warming.

5.3.9 Oil and fuel Spills

The machines on site may be containing moving parts which will require continuous oiling to minimize the usual corrosion or wear and tear. Possibilities of such oils spilling and contaminating the soil and water on site are real. Waste oils and greases should be disposed off in the designated oil receptors.

5.4 Issues of Concern and their Respective Mitigation Measures

5.4.1 Soil Erosion

Soil erosion is loss of topsoil through agents of soil erosion like wind and water (rain), during the implementation phase of the project, light machinery under use will loosen the soil making it susceptible to soil erosion. In this particular project soil erosion will not be a major environmental issue of concern since there is hardly any major excavation or levelling to be done. However, it is important to note that the project will involve excavation and burying of underground fuel tanks, digging of foundation trenches and hence soil disturbance which will expose and set the soils loose to the agents of soil erosion.

Mitigation measures

- Avoid unnecessary movement of soil materials from the site.
- Use of heavy machinery which will loosen the soil should be discouraged.
- Control construction activities especially during rainy / wet conditions.

5.4.2 Noise and Public Disturbances

Noise is unwanted/undesirable sound that can affect job performance, safety, and health. Psychological effects of noise include annoyance and disruption of concentration. Physical effects include loss of hearing, pain, nausea, and interference with communications when the exposure is severe. As explained earlier, construction activities will be generating some noise. Such noise will mainly emanate from the construction machinery and equipment which include concrete mixers and compactors and noise that will emanate from the workers on site.

Mitigation measures

- Construction works should be carried out only during the specified time of 0800 hrs to 1700 hrs.
- Machineries should be maintained regularly to reduce noise levels.
- Workers should be provided with protective materials when operating noisy machinery and when in a noisy environment. E.g. ear muffs.

5.4.3 Water

The proposed project will need a lot of water since construction activities are known to be a lot, the various structures will require water; construction workers will create additional demand to the supply in some ways. Once the project is complete, water will also be required. The site is served by Nairobi water. The contractor will have storage tanks onsite to store water thus no waste will be experienced.

Mitigation measures

- The contractor should install water tanks on site to conserve water for construction activities especially during periods of high water demand which will mainly be during civil works.
- Encourage water re-use/recycling mostly during construction to avoid water wastage.

- Keep the water taps off when not in use.
- Install tanks to tap rain water to increase to the water reserve.

5.4.4 Air Quality

The construction activities on the site will result to increased dust and gas emissions. Some Construction machinery and trucks generate hazardous exhaust fumes such as Carbon Oxides (CO2), Sulphur Oxides (SO2) and Nitrogen Oxides (NO2). Dust, as caused by vibrations of machines and vehicle movement suspends in the air mostly during dry spells. Such dust and gases have direct negative impact to the quality of air.

Mitigation measures

- Provide protective equipment and materials and clothing such as nose masks and goggles
- Regular and prompt maintenance of construction machinery and equipment. This will minimize production of hazardous gases.
- Areas generating dust particles should be sprinkled with water to reduce dust blowing out over the area and should be enclosed where possible to mitigate effects of wind on them.
- Workers should go for regular health check-ups to ascertain their health standards and should be encouraged to take milk regularly as this will control the level of congestion of dust in their chests.
- The generator exhaust should be directed away from the facility to avoid smoke clouding.

5.4.5 Oil Leaks and Spills

Oil spills are prevalent in construction sites. Though this may not be common, it is wise to control and observe the little leaks and spills that will occur especially during maintenance of the involved machinery and vehicles.

Mitigation measures

- All machinery should be keenly observed not to leak oils on the ground. This can be ensured through regular maintenance of the construction machines and equipment.
- Maintenance should be carried out in a well-designed and protected area and where oils/grease is completely restrained from reaching the ground. Such areas should be covered to avoid storm from carrying away oils into the soil/water systems.

- All oils/grease and materials should be stored in a site's store which is usually located in the contractor's yard/site office.

5.4.6 Solid Waste

- Construction activities results to increased solid wastes within the site. Such waste materials include stones, pieces of metal rods, pieces of iron, pieces of pipes, papers, equipment wrappings etc.

- On completion, the property management should adapt a waste management system to handle any waste that will be generated from various operations.

5.4.7 Flora and Fauna

Removal and disposal of such refuse and other related wastes comes in handy in this project.

Mitigation measures

- The waste materials should be properly segregated and separated to encourage recycling of some of them such as concrete debris which can be used as backfills with the approval of the site engineer. The site has minimal vegetation which has no conservation values. Some temporary and permanent disturbances will be caused to small animals.

Mitigation measures

- Flora and fauna on site should be conserved.

5.4.8 Construction Materials

They include stones, sand, cement, ballast and steel rods for the raft, walls and the columns. They should be of the good quality.

Mitigation measures

- Should be sourced only from licensed dealers and suppliers.

- Quality should be thoroughly monitored through regular tests e.g. cube tests.

- Recycling of raw materials should be encouraged, e. g, pieces of stones and construction waste can be used for backfilling.

5.5 Occupational Health and Safety (OHS)

During construction, there will be increased dust, air and noise pollution. These are considered as negative impacts. The residents and workforce involved will be more subjected to these

environmental hazards. Food for the construction workforce is usually provided by mobile vendors most of which operates without health licenses. This can compromise the health of the workers especially if such foodstuffs are prepared in unhygienic conditions.

Mitigation measures

- All workers should be provided with full protective gear. These include working boots, safety harness, overalls, helmets, goggles, masks and gloves.
- People preparing food for the workers on site should be monitored to ensure that food is hygienically prepared.
- A first aid kit should be provided within the site. This should be fully equipped at all times, site workers should also be trained on basic First Aid Skills.
- Some tasks require one to be in very good health, workers should be subjected to medical examinations before starting work. This will ensure that only medically fit persons are engaged for such tasks.
- The site workers should be warned of drugs and alcohol since they might affect their concentration at work causing accidents.
- Sanitary facilities should be provided on site during construction and should be kept clean at all times.

5.5.1 Security

Security is a fundamental aspect to consider in any development. Good security ensures that materials and equipment are not stolen or vandalized from site and that construction activities are not disrupted with during the normal working hours.

Mitigation measures

- A site office should be constructed on site to store materials and equipment while not in use.
- The site should be enclosed using suitable walls to beef-up security and to control movement in and out of site.
- Lighting as well as security alarms should be installed on site after completion.

- There should be security guard stationed on site to monitor movements of people in and out of the site area.

5.5.2 Fire Safety

Fire safety measures should be considered in any development plan. Fire outbreaks are common occurrences in many premises mainly due to poor installation of electric devices or poor handling of fire equipment or flammable substances. In this development proposal; proper care will be taken into account during and after the implementation phase so as to minimize chances of fire outbreaks.

Mitigation measures

- Fire alarm and fighting equipment should be installed within the facility once it is complete.
- A "No smoking" notice should be placed strategically on site.
- Ensure that all firefighting equipment installed on the site once it is complete are regularly maintained and serviced.
- Dry sand buckets should be placed in strategic places in case of fire.
- The facility operators should be trained on how to use various firefighting devices.

CHAPTER SIX

ALTERNATIVES AND PROPOSED ACTION

6.1 Analysis of Alternatives

Alternatives to the project, including the no action alternative will be presented in this section, as well as the historical use of the overall area in which the project site is located. These alternatives will be discussed from environmental and socio-economic perspectives.

6.2 The No-Action Alternative

Without the proposed development, the location will remain in its current abandoned state. This no-action alternative in itself, presents environmental concerns, as the site in its current state is prime but underutilized. From a socio-economic perspective, the no-action alternative will definitely not yield any benefit to the proponent and the surrounding communities. This alternative will mean that the project does not proceed

Advantages

- Air pollution from dust as a result of the construction process will not occur
- There will not be soil compaction as a result of heavy machinery use
- There will be no soil or water contamination

Disadvantage

- There will be no creation of employment
- There will be no additional facility to drive socio-economic development
- There will be no secondary development as a result of the project
- The improvement in infrastructure as a result of the project will not be realized
- The value of land might improve but it will remain underdevelopment
- Provision and supply of construction materials will not improve

6.3 Relocation Alternative

Relocation option to a different site is an option available for the project implementation. At the moment, there are no alternative sites for the proposed development (i.e. the project proponent does not have an alternative site). This means that the proponent has to look for the land if relocation is proposed. Looking for the land to accommodate the scale and size of the project and completing official transaction on it may take a long period. In addition, it is not guaranteed that such land will be available.

6.4 Comparison of Alternatives

Under the NO Action alternatives, no development will be allowed therefore, there will neither be benefits from the project nor the insignificant effects. Under the proposed development alternatives, the proposed development will create temporary employment for contractors. Provided the mitigation measures are implemented, including construction and best management practices, insignificant impacts on soils and water quality are anticipated. Commitments associated with this alternative will ensure that potential impacts are avoided or reduced to levels of insignificance.

6.5 Site Decommissioning Phase

No project will exist forever, at some point the site will be demolished and the space it had occupied be restored to its original form. This exercise will have some impacts to the environment. The following takes place during decommissioning:-

All foundations must be removed and recycled, reused or disposed of at a licensed disposal site

- Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the material should be taken to a licensed waste disposal site.
- Donate reusable demolition waste to charitable organizations, individuals and institutions
- Implement an appropriate re-vegetation programs to restore the site to its original status
- Consider use of indigenous plant species in re-vegetation.

- Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent areas and the development**.**

The above activities will also have some impacts to the environment, this will involve:-

- Occupational health risks like cuts and bruises.
- Production of solid, liquid and gaseous waste.
- Pollution of air with dust particles.
- Likely spillage of fuel, oil and grease.
- Vibration caused by the site construction equipment and machines e,g drilling machines.
- Landscaping the land to its original form.

All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused.

CHAPTER SEVEN

ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS

7.1 Introduction

The environmental management plan involves risk management strategies that should be undertaken by the project proponent, project manager and the residents to mitigate environmental degeneration. They are approaches to monitor, control, reclaim and restore the environment back to its appropriate state. EMP's for projects thus provide logical frameworks within which the identified issues of environmental concern can be mitigated, monitored and evaluated. Environmental monitoring involves measurement of relevant parameters, at a level of details accurate enough, to distinguish the anticipated changes. Monitoring aims at determining the effectiveness of actions to improve environmental quality.

The environmental management and monitoring plans have been developed and outlined to bring home the key findings of the Environmental Impact Assessment of the project in mention, recommending necessary mitigation actions, defining roles and the estimated cost. The EMP outlined in the tables below addresses the potential negative impacts and mitigation measures as well as roles and costs that can help to determine the effectiveness of actions to upgrade the quality of environment; as regards the proposed project.

Environmental Management plan

Environmental Impacts	Mitigation measures	Responsible party	Time Frame	Cost estimate
Vegetation Disturbance	-Ensure proper demarcation and delineation of the project area to be affected by the construction work -Specify location for vehicles and equipment and areas of the site which shall be kept free of traffic equipment and storage	Contractor Proponent	Continuous	Kshs. 80,000

	-Designate access routes and parking within the site -Introduction of vegetation(trees, shrubs and grass) on open spaces and around the project site and their maintenance -Design and implement an appropriate landscaping progamme to help in re-vegetation of open parts of project area after construction			
Dust Emission	-Ensure strict enforcement of on-site speed limit regulations -Sprinkle water during excavation works by heavy machines -Sprinkle water on graded access routes when necessary to reduce dust generation by construction vehicles -Dust masks to be provided to employees and should be worn -Use environmentally friendly fuels -Minimize the period for machinery idling -Pursue good practices in energy use during operations and sensitize staff	Contractor Proponent	Continuous	Kshs. 150,000 per quarter

	-Provide appropriate personnel protective equipment to site workers			
Increased solid waste generation	-Use of an integrated solid waste management system i.e. through a hierarchy of options: 1. Reduction at source, 2. Recycling, 3. Reusing, 4.Incineration, 5. Sanitary Land filling -Through accurate estimation of the dimensions and quantities required. -Use of durable, long lasting materials that shall not need to be replaced as often as, thereby reducing the amount of waste generated over time. -Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements -Use building materials that have minimal or no packaging to avoid generation of excessive packaging waste -Reuse packaging materials such as cartons, cement bags,	Contractors Drivers	During construction	Part of/Covered in the Project Cost

	empty metal and plastic containers to reduce waste at site. -Dispose waste more responsibly by contracting a waste registered handler who will dispose the wastes at designated sites only. -Waste collection bins to be provided at designated points only.			
Health and Safety	-Comply to the OSHA -Provide personnel and passers-by signage and warnings traffic control signs and warning -Develop a traffic management plan to ensure that site vehicles do not interfere with the regular traffic on the Project area -Provide for appropriate signage and warnings at work sites -Provide appropriate personnel Protective Equipment (PPE) to site workers -Provide for First Aid facilities as per the OSHA, 2007 -Provide for an appropriate	Contractor Proponent	Continuous	Kshs. 200,000

	traffic management plan to avoid congestion on road leading to the project area -Provide and clearly display emergency contacts -Develop and implement detailed and site specific Emergency Response Plans.			
Fire hazards	-Ensure fire extinguishers are stationed in visible places. -Security personnel and occupants to be trained in firefighting skills. -Drilling exercise to be conducted regularly. -Train substation operators on firefights -Install smoke fire detectors and fire alarms	Proponent	Servicing of fire extinguishers and fire drills to be done every six months	Ksh.70,000= per6 months
Energy Resources Management	-Ensure machinery is regularly serviced to improve efficiency in consumption of energy -Energy management through use of sound/appropriate equipment -Application of rated equipment in welding and related works -Use of efficient mechanical plant and energy savers on	Contractor Proponent	Continuous	Kshs.200,000

	sites			
Water and energy management	-Provide adequate and appropriate drainage infrastructure where required -Ensure machinery is regularly serviced to avoid leakages and/or spillages -Oils, fuels and other materials to be stored in accordance with the manufacturer's safety data sheets (MSDS) -Train staff on spill response -Implement erosion and sedimentation controls -Energy management through use of sound equipment -Application of rated equipment in welding and related works -Use of efficient mechanical plant and energy savers on sites	Contractor Proponent	Continuous	Kshs.100,000
Noise and Vibrations	-Sensitize construction vehicle drivers and machinery operators to switch off engines or machinery not being used -Sensitize the construction vehicle drivers to avoid unnecessary hooting. -Ensure that construction machinery are kept in good condition to reduce noise generation -Sound barriers to be erected around the construction site	Contractor Proponent	During construction and transportation of materials	250,000

	-The noisy construction works should be entirely planned to be during day time			
Increased storm water, runoff and soil erosion	-Surface runoff and roof water shall be harvested and stored in reservoirs so that it can be used for other purposes within the project site. -A storm water management plan that minimizes impervious area infiltration by use of recharge areas and use of retention with graduated outlet structures shall be designed -Apply soil erosion control measures such as leveling of the project site to reduce run-off velocity and increase infiltration of storm water into the soil. -Ensure that construction vehicles are restricted to use the graded roads -Ensure that compacted areas are ripped to reduce run-off	Contractor Proponent	Continuous	Kshs.80,000
Oil Spills	-Install oil trapping equipment's in areas where there is a likelihood of oil spillage such as during the maintenance of construction equipment -Soil in such an area shall be well protected from contamination	Contractor	During both construction and operation phases of the project.	Kshs.90,000
Insecurity	The establishment to have 24-hour security guards to protect life and property.	Occupiers and Property Managers	Daily on 24-hour basis	Part of/Covered in the Project Cost

Decommissioning Phase

Table 7- 1: Environmental Management/Monitoring Plan for the Decommissioning Phase

Recommended Mitigation Measures	Responsible Party	Time Frame
All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused a far as possible	Contractor Proponent	Immediately
All foundations must be removed and recycled, reused or disposed of at a licensed disposal site	Ditto	Immediately
Where recycling/reuse of the machinery, equipment, implements, structures, partitions and other demolition waste is not possible, the materials should be taken to a licensed waste disposal site	Contractor Proponent	Immediately
Donate reusable demolition waste to charitable organizations, individuals and institutions	Contractor Proponent	Immediately
Implement an appropriate re-vegetation programme to restore the site to its original status	Contractor Proponent	Immediately
Consider use of indigenous grass species in re-vegetation	Contractor Proponent	Immediately

CHAPTER EIGHT

ENVIRONMENTAL HEALTH AND SAFETY (EHS)

8.1 EHS Management and Administration

The EHS is a broader and holistic aspect of protecting the worker, the workplace, the tools / equipment and the biotic environment. It is an essential tool in determining the EIA study. The objective of the EHS on the proposed project is to develop rules that will regulate environmentally instigated diseases and occupational safety measures during construction and the operation phases of the proposed project by:

- Avoidance of injuries
- Provision of safe and healthy working environment for workers comfort so as to enhance maximum output.
- Control of losses and damages to plants, machines, equipment and other products.
- Enhance environmental sustainability through developing sound conservation measures.

8.2 Policy, Administrative and Legislative Framework

It is the primary responsibility of the contractor to promote a safe and healthy environment at the workplace and within the neighborhood in which the proposed project will be constructed by implementing effective systems to prevent occupational diseases and ill-health, and to prevent damage to property. The EHS Management Plan when completed will be used as a tool and a checklist by the contracted engineers in planning and development of the construction of this project.

8.3 Organization and implementation of the EHS Management Plan

The contactor shall use the EHS plan at the proposed project site both during construction and operation. The engineer will use it during construction phase with the assistance of an EHS consultant who shall enforce its provision throughout the life of the project.

8.4 The Guiding Principles to be adopted by the contractor

The company will be guided by the following principle: -

- It will be a conscious organization committed to the promotion and maintenance of high standards of health and safety for its employees, the neighboring population and the public at large.
- Ensuring that EHS activities are implemented to protect the environment and prevent pollution.
- Management shall demonstrate commitment and exercise constant vigilance in order to provide employees, neighbors of the project and the environment, with the greatest safeguards relating to EHS.
- Employees will be expected to take personal responsibility for their safety, safety of colleagues and of the general public as it relates to the EHS management plan.

8.5 EHS management strategy to be adopted by the contractor

The following strategies will be adopted to achieve the above objectives:

- Create an Environment Health and Safety Management committee and incorporate EHS as an effective structure at various levels and units to manage and oversee EHS programs in all construction and operation phases of the project
- Maintain an effective reporting procedure for all accidents.
- Provide appropriate tools and protective devices for the success of the project.
- Encourage, motivate, reward and support employees to take personal initiatives and commitment on EHS.

8.6 Safety Agenda for both the proponent and contractor

There will be a permanent EHS agenda during construction.

(a) Contractors

The EHS management plan code of practice shall be applicable to the contractors working in the premises, and shall be read and signed. It shall be incorporated into the contract to perform work. This should also remind the contractor of his/her;

- Legal requirements.

- Statutory obligations.
- Obligation to lay-down a system for reporting accidents
- Responsibility to ensure that his/her employees are supplied with personal protective equipment and where applicable as per the EHS management plan for the whole project.
- Responsibilities as it relates to contracting an EHS consultant in liaison with the proponent
- Obligation to ensure that he obtains detail of jobs and areas where permit-to-work must be issued

(b) All residents' and workers' responsibility

- Know the location of all safety equipment, and learn to use them efficiently

8.7 Safety requirement at the project site during construction and operation Period

(a) The contractor

The contractor will ensure that:

- Safe means of entry and exit at the proposed project site.
- Ensure adequate briefing of job at hand on the safe system of work before commencement of work.
- The EHS coordinator must be in attendance at all times throughout the duration of the project.
- The EHS consultant must maintain constant assessment of the risk involved as the work progresses
- A safety harness must be worn before entry into all confined spaces
- An EHS consultant must be posted at the entrance at the project site to monitor progress and safety of the persons working at the construction site.

(b) The Traffic / Drivers

Within the construction premises, the following traffic rules will be observed: -

- Observe speed limits and all other signs and obey traffic rules.
- Use the vehicle for the purpose to which it is intended only.

c) Fire hazard at the construction site,

Workers at the site shall ensure that: -

- Oxy-acetylene cylinders are not contaminated with grease or oil.
- Oxy-acetylene cylinders are not subjected to direct sunlight or heat.
- Oxy-acetylene cylinders are not to be used or stored standing in a vertical position.
- When in use, ensure the inclination should never be over 30° from the vertical.

8.8 Welding at the construction site

It is the responsibility of the contractor during construction to: -

- Ensure that welding clamp is fixed such that no current passes through any moving parts of any machine.
- Ensure that all welding clamps are in good operating condition and conduct current without arcing at the point of contact.
- Ensure that welding clamps are free from any contact with explosive vapors i.e. Oil spillage, Fuel tanks, Coal dusts and miscellaneous combustible material (e.g. Cotton rags filter bags, rubber belting, and wood shavings).
- Ensure that any slag or molten metal arising from welding activities does not start up fires by:
- Clearing combustible material to a distance of at least 3 meters away from the working area or covering area with metal or asbestos sheet.
- Appropriate fire extinguisher is to be kept available for immediate use at all times

8.9 Emergency procedure during construction and operation

An emergency situation means:

- Unforeseen happening resulting in serious or fatal injury to employed persons or the neighbouring communities.
- Fire or explosion.
- Natural catastrophe.
- In the event of such an emergency during construction, the workers shall:
- Alert other persons exposed to danger.
- Inform the EHS coordinator.
- Do a quick assessment on the nature of emergency.
- Call for ambulance on standby.
- When emergency is over the EHS coordinator shall notify the workers by putting a message: **"ALL CLEAR"**

In the event of such an emergency during operation the workers shall: -

- Alert other persons exposed to danger.
- Ring the nearest police station
- Call for ambulance.

CHAPTER NINE:

COMPREHENSIVE TRAFFIC MANAGEMENT PLAN

9.1 Background

The urban transportation system is the engine of the economic activities in all-urban communities all over the world, and consequently sustains livelihood of the people living in them (Adams, 2007). Typical urban transportation facilities include railways, waterways, airways and roads. Among these, the big proportion consists of roads (Sanjay, 2005). Logically, most planning and research efforts have focused on the road system. In essence, road transportation system is the major player in the economic activities of most urban centers. In recent times, many cities have seen a large increase in road traffic and transport demand, which has consequently led to deterioration in capacity and inefficient performance of traffic systems, manifested in road traffic congestion (Kolowksky and Moshe, 2005). There is no single, broadly accepted definition of traffic congestion. One of the principal reasons for this lack of consensus is that congestion is both a physical phenomenon relating to the manner in which vehicles impede each other's' progression as demand for limited road space approaches full capacity and a relative phenomenon relating to user expectations vis-à-vis road system performance (Bickerstaff and Walker, 2005). Park, (2004) contends that traffic congestion is a situation in which demand for road space exceeds supply. Congestion is the impedance vehicles impose on each other, due to the speed-flow relationship, when the use of a transport system approaches capacity. It is hard to say what is traffic congestion exactly, since there is no standard of traffic congestion worldwide and traffic system varies from one city to another.

9.2 Causes and Impacts of Traffic Congestion

The most known causes of traffic congestion are recurrent and non-recurrent congestion. Recurrent Congestion Regularly occurred on the transportation system, such as daily commuting or weekend trips, traffic is vulnerable to sudden breakdowns as demand approaches the maximum throughput capacity on a link or in the network. "Roads are operated near to their maximum capacity saturated intersections can quickly give rise to queues whose upstream propagation can swamp local roads and intersections" (European Conference of Ministers of Transport, 2007, p. 15)

8.3 Non-Recurrent Congestion

It occurs irregularly and unexpectedly, such as crashes, special events, snow, rain, fog and so on that affect parts of the road transportation system which is not easily predicted. Inadequate infrastructure facilities. In literatures, most writers argued that traffic congestion has an impact on travel time and fuel consumption, among them Ogundipe, (2007, p. 170) illustrates that "traffic congestion can cause more fuel to be used." European Conference of Ministers of Transport, (2007) supports Ogundipe's idea above. Hours are lost or delayed due to various factors, among which the direct indicators are the imbalance between demand and supply: number of vehicles or traffic volume, like trucks, buses, private cars etc. exceeds the existing road capacity. Moreover, the capacity of a road can be measured by comparing the traffic volume and travel time. However, traffic management, like on-street parking conditions can affect the performance of the roads.

9.4 Solutions for Congestion Relief

Even if there is no single best approach to overcome congestion as it takes on many faces (caused by many different processes and occurs in many different contexts), demand management strategies also called mobility management can help in solving multiply problems and provide various benefits of the transport system, including congestion reduction, vehicle fuel efficiency, and parking improvement (Litman, 2009). However, from various interrelated strategies, there are some more effective strategies in overcoming traffic congestion. This may include along with the supply side that account for how residents and roadway users as well as their longer-term mobility preferences are fulfilled (David, Karen, and Rebecca, 2001).

9.5 Parking Management

Parking Management, is an activity of supply, price and regulation of parking facilities (VTPI, 2008), significantly affects travel behavior: if parking becomes more abundant and cheaper, will lead to increase automobile demand that result in large volume of vehicles. On other side, it can play a great role in solving congestion problem if it managed well. The provision of parking should not be too much as well as insufficient. Thus, parking policy and provision requirements are essential in reducing traffic congestion (Du Toit, et al, 2001). Moreover, Hitge and Roodt, (2006) state clearly as: ... the duration of car parking has a direct relation with the size of shopping center, economic activity of the center district, and policy, like parking cost. So that,

from different alternative, factors like availability of suitable public transport, proximity of parking, and paid parking would lead to a reduction in parking demand.

The proponent has provided adequate parking for tenants at the residence. The construction will be of one basement parking and two ground floor parking lots.

9.6 Modifying Existing Infrastructure

There are many approaches that can squeeze additional capacity out of existing infrastructure. These include adding lanes, re-allocating road space, modifying intersections, modifying the geometric design of roads or creating one-way streets. These approaches can benefit either car users or public transport; however as with operational management policies and these interventions should not seek to bring traffic flows so close to the maximum capacity of the roadway that the probability of sudden traffic breakdowns becomes unacceptable. While these types of measures are ideally suited for treating bottlenecks, care should be given to consider the downstream impacts of releasing greater traffic flows.

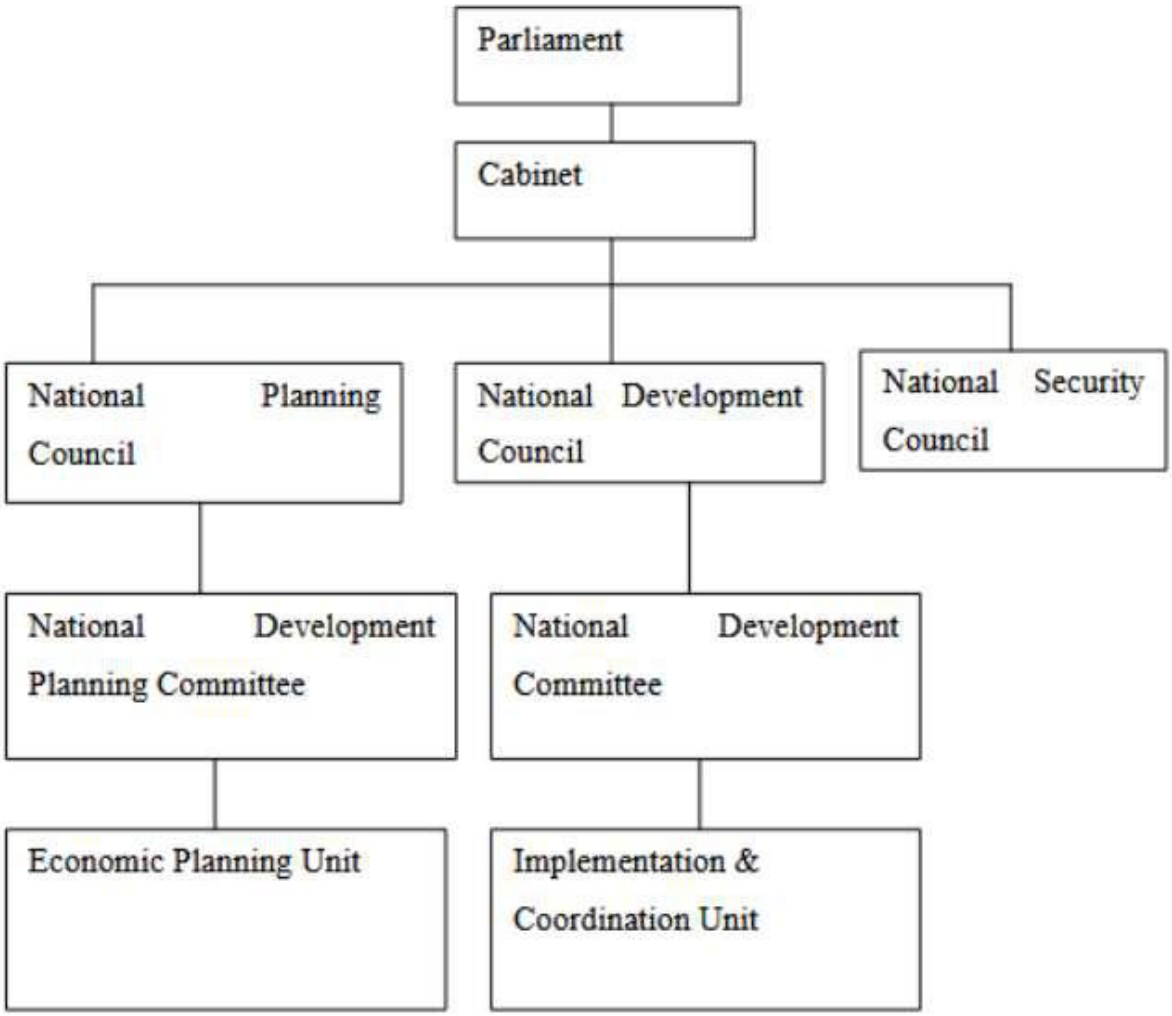
9.7 Flextime

To overcome congestion problem, most writers, such as David, Karen and Rebecca (2001), and Orn (2002) suggested that flextime work schedule is one mechanism that allow some different working time for daily work of people. For instance, it is better to have different work schedule of the day instead of starting all works at the same time (start work at the same time in the morning and end in evening) that lead high unidirectional travel demand or making trip together.

9.8 Maximum traffic inflow capacity

The proposed site road network is extremely good. The proposed site is at Iregi road within Parklands that is accessible through Limuru road, Ring road, Mpaka Road and Suswa Road. If coming from town can access through Wambugu road. With the proposed dualling of the Limuru road and ground works already commenced, it will ease traffic flow. During construction period, the Lorries/vehicles delivering materials to the site shall have a holding bay and shall be having one lorry at a time within the construction site. There will be no obstruction of daily traffic flow along the 5th Parklands Avenue. A traffic marshal shall be employed to control the incoming vehicles to and from site at the junction of Iregi road and 5th Avenue if need be.

Traffic Flow Management Policy Framework



Source: Economic Planning Unit (2002)

The transportation planning and management system is made of various public and private actors. The issues and problems faced by the planning and management systems include lack of coordination between institutions, insufficient capacity and capability to carry out planning at appropriate scales (e.g. local, regional and national), enforcement problems, problems with private sector “profit maximizing” interests, incentives by both government and private companies that promote private auto use. This therefore implies that the proponent is limited in terms of road expansion has it can only be done by the government agencies e.g Kerra Conclusion Excessive traffic circulation problem and degraded road traffic conditions are not an unavoidable outcome of city life. These findings highlight that much can, and should, be done to better manage traffic circulation problem in large urban areas. Tackling traffic circulation problem can deliver lasting benefits for the entire urban region. It is evident that t cities mainly in developing countries lack circulation plans. A circulation plan is a schematic empirical projection/model of how pedestrians and/or motor vehicles flow through a given area, like, for example, a neighborhood or a Central Business District (CBD). Circulation plans are used by city planners and other officials to manage and monitor traffic and pedestrian patterns in such a way that they might discover how to make future improvements to the system

SOCIAL IMPACTS ASSESSMENT

This is a very important and an integral part of the EIA process, which is a legal requirement and a very important tool for collection of the data and especially the baseline/background information. The SIA helps bring out the contentious issues and gives a chance to those who may be affected by a proposed project to give their views, inputs and opinions and any significant issue is addressed at the initiation stage. This enables evaluation of the public and neighbor's views and is thus a very important part of the study. The proposed type of development has been embraced in Parklands which is developed with similar developments and others are ongoing projects of similar magnitude. The stakeholders raised the following concerns: -

- Noise and dust pollution
- Water shortage
- Insecurity from construction workers
- Sewerage blockage
- Visual intrusion
- Destruction of access road by heavy machinery/lorries
- The project will be down-grading the area
- Effects on serenity of the area
- Pressure on existing infrastructure including roads

These impacts shall be mitigated at site by the proponent and the contractor. The public consultation held at site and at the High ridge Primary were successful and the stakeholders welcomed the project. They however requested that the local community should be engaged to provide labor and security once the project commences. Other issues are addressed within this report and through the Environmental Management Plan.

Public Notices

Public notices will be put around the site, on the newspapers and on local radio as per regulation 17 (a) of the Environmental (Impact Assessment and Audit) Regulations, 2003.

CHAPTER TEN

CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

The Kenyan government has with great concern realized shortfall in standard (urban) housing infrastructure and commercial development and has come up with a policy that aims at providing over one hundred thousand new house units per annum. It has in addition recognized the input of individuals and private developers in providing planned house infrastructure to bridge the gap in the housing sector. The proposed project is focused on the construction of the proposed residential apartments cum Commercial off Limuru road. This project has met all requirements in terms of design and space, and all the safety measures have also been put into consideration. The project is not expected to have any negative impact to the environment especially due to its location; the area is quite secure and has basically all the basic facilities. It is our considerable opinion that the proposed development is a timely venture and will supplement considerably to the government policy. It is thus our recommendation that the project is allowed to go ahead with strict implementation of the mitigation measures provided to minimize anticipated environmental impacts. More focus shall be put to minimize the occurrence of impacts that will degrade the environment while exploiting those impacts that are positive.

Finally, the project proponent has promised to work closely with environmental experts, residents, local authority, local County Environment committees and NEMA to ensure smooth facilitation of the issues that touch on environment to include; water supply, effluent disposal, solid waste management, air pollution but to mention a few. This will ensure that environmental concerns are integrated into the project process.

9.2 Recommendations

Recommendation for the preventive and mitigation of adverse impacts is presented as follows:

a. The proponent will ensure that the development has been approved by the relevant regulatory departments as Department of Physical planning, Ministry of Lands and Settlement, health, NEMA etc. the proponent should therefore follow guidelines as set by the government to safeguard EMP principles during the construction and operation phases of the proposed project.

b. It is important that warning information signage is erected strategically at the site. This will indicate the operation hours and works are likely to start and completed. The signage will be positioned in a way that both pedestrians and motorist will see.

c. All solid waste and debris resulting from the construction activities must be disposed off at approved dumpsites.

d. All construction materials to include, sand, gravel, hardcore, metals, treatment chemicals must be sourced from known and approved dealers or manufacturers who have environment sign of quality.

e. Ensure that construction activities must be undertaken only during the day i.e. 0800 hours to 1700 hours. This will minimize anticipated disturbance and nuisance to the residents of adjacent properties and the general public.

f. The service road to the site be well maintained even after use by the heavy machinery e.g. Lorries.

g. Traffic along nearby roads should be controlled and informed during construction hours especially of heavy turning Lorries and plant in and out. This will minimize potential accidents from unsuspecting motorists.

h. The contractor will ensure that loose soils must be covered to prevent erosion. Other soil erosion preventive measures including watering during dry season to prevent wind erosion will be implemented. Any stockpiles of earth will be enclosed or covered to reduce dust to the neighbors.

i. Once earth works have been done, restoration of the worked areas should be carried out immediately through backfilling by experienced landscape experts. This will include planting trees and grass, flowers etc.

j. Drainage system will be properly designed, installed, and regularly maintained to prevent storm water runoff.

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10. United Nations (1987) The Rio Declaration on Environment and Development

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12. Sombroek W. G., Braun H. M. M. and Van der Pouw B. J. A., 1982, Exploratory Soil

Annexes

Copy of title deed

Copy of KRA PIN Certificate

Copy of certificate of incorporation

Copy of CR12

Copy of Bills of quantities

Copy of Architectural drawings

Copy of Change of user