ENVIRONMENTAL SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED KITUSURU FALLS RESIDENCE ON L. R NO. KABETE /KIBICHIKO / 3045 IN WANGIGE, KABETE SUB-COUNTY, KIAMBU COUNTY

PROPONENT:

KINSFOLK LIMITED
P.O BOX 7538-00100
Nairobi, Kenya
Email: sales@kinsfolkshomes.com
TEL/CELL: +254 722 875 908; +254 724 581 426

CONSULTANT

HAPPY FOREST LIMITED
P.O. Box, 45947-00100
Nairobi, Kenya.
Email: info@happyforestltd.com
Tel/Cell: +254 020 4401889 / 0743-55 2659

@May, 2022

DECLARATION

In undertaking this task, the team endeavor to comply with the legal requirements provided for and to guide the practices, activities and conduct of environmental impact assessment, as contained in the Environmental Management and Coordination Act Cap.387, the compliance to Environmental (Impact Assessment and/ Audit) Regulations, 2003 and other subsequent legislations relating to the environment. The required professional standards and practices have been applied in carrying out this work/ activity according to the provisions provided for by the NEMA code of practice and professional ethics and conduct for environmental impact assessment and audit experts.

Signature: …….

Date: ……

Mr. John Mukundi
ESIA/EA Lead Expert
Reg. No. 1313
Tel: 0722 900 095

Signature: *…….....*
Date: *……*

Mr. Allan Owino
Environment and Social safeguards
ESIA/EA Lead Expert
Reg. No 6023
Tel: 0729 924 873

THE PROPONENT

I…….. on behalf of **Kinsfolk Limited** submit this Environmental and Social Impact Assessment Study report for the proposed Kitusuru Falls Residence within Kiambu County. To my knowledge all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed residential project.

Signed on this……. day of ***May 2022***

Signature…….

Designation: …….

DOCUMENT CONTROL

Client: Kinsfolk Limited P.O. BOX 7538-00100 Nairobi Kenya	**Project No:**01
Report Title: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED KITISURU FALLS RESIDENCE	**Date:** May 2022

Revision	Description	Report prepared by	Reviewed by
01	Draft Report	Allan Owino Florence Warui Faith Angasa Japheth Mmudi Wendy Awiti	John Matheri
Preparation of this draft report has been undertaken within agreed terms of reference. Original comments from the Client have been taken into consideration.			

TEAM COMPOSITION

NO	NAME	ROLE
1)	John Matheri	Lead Consultant
2)	Allan Owino	Environment and Social Safeguards
3)	Florence Warui	Environmental Expert
4)	Faith Angasa	Socio-Economist
5)	Japheth Mmudi	Environmental Expert
6)	Wendy Awiti	Environmental Expert

ACRONYMS

CBO	Community Based Organizations
CSR	Community Social Responsibility
GoK	Government of Kenya
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESMP	Environmental Social and Management Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
MSDS	Material Safety Data Sheets
NEMA	National Management Authority
NGO	Non-Governmental Organization
OSHA	Occupational Safety and Health Act
OHSO	Occupational Health and Safety Officer
PPE	Personal Protective Equipment
SPSS	Statistical Package for Special Sciences
ESIA	Environmental and Social Impact Assessment
PLWD	Persons living with disability
SMMP	Social Management Monitoring Plan

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PLATES

LIST OF TABLES

EXECUTIVE SUMMARY

Happy Forest Limited, NEMA registered EIA/EA Firm of expert has been contracted by **Kinsfolk Limited, (**herein referred to as the proponent**)** to carry out an Environmental and Social Impact Assessment report for the proposed Residential apartments comprising of a total of 256 modern houses divided into three Categories to meet divergent needs and lifestyles of home owners. These categories are one-bedroom apartment, two bedrooms and three bedrooms' apartment. The proposed project will be on Plot L.R No. Kabete /Kibichiko / 3045 located off Ngecha Road along Getathuru Road, in Kibichiko area, Kiambu County.

A change of use planning briefs has been developed and submitted to Kiambu County Gayathri Government for approval. This EIA report has been undertaken to comply with the Legal requirement stipulated in the Environmental Management and Coordination Act CAP 387 and the subsequent Legal supplement of 2003.

The Environmental Management and Coordination Act (EMCA) provides for a full Environmental Impact Assessment study of a new housing estate development exceeding 100 housing units in order to identify the potential adverse impacts of the development and provide for adequate mitigation measures. An Environmental and Social Impact Assessment (ESIA) of the proposed housing project was conducted in line with the Act and following a conventional approach in the assessment.

Methodology

Public participation was held with community members to identify the community's perceptions of the Project. Areas of potential conflicts, social issues of concerns were identified and means of mitigation developed. Desktop study and document review also formed basis of the literature review and secondary data analysis was done. The Constitution of Kenya 2010; The Kenya Vision 2030; just to name a few formed the basis of legislation review. Observations was another tool used during data collection exercise as a means of ascertaining some of the issues raised during public meeting.

In addtions to this the social team did a socio-economic survey to establish socio-economic status of the community in the project area. Questionnaires were administered by trained enumerators to collect both quantitative and qualitative data. The data were analyzed using Statistical Packages for the Social Sciences. (SPSS) and Microsoft Excel to acquire graphic representation of the information obtained from the enumerations.

Policy, Legal and Regulatory Framework

The study identified a number of policies which relate to Socio-economic well-being and they include but not limited to the following; Environmental Policy, Land Policy etc. Legislative framework identified included the following; The Constitution of Kenya, Environmental Management & Coordination Act (EMCA) Cap 387, County Government Act 2012, Work Injury Benefit Act, 2007 HIV/AIDS Prevention and Control, Occupational Safety and Health Act 2007, National Land Commission Act 2012 among others. Institutional framework included; National Environment Management Authority (NEMA) National Youth Council among others.

Project impacts

The assessment of the social impacts was based on field inspections, socio-economic baseline survey, literature sources and public consultations. These have been categorized as follows:

i. *Positive impacts*

The positive impacts include; improvement of living conditions and economic benefits which include employment during construction.

ii. *Negative impacts*

The Project identified as well as provided mitigation measures for some anticipated negative impacts or areas of improvement during the Project's life cycle.
The negative impacts include Increased noise and vibrations from construction vehicles and other construction machinery, Reduced ambient air quality during construction due to emissions of exhaust
fumes from vehicles and equipment and dust from earth works, Potential pollution of the neighboring Getathuru stream during construction by silt, hydrocarbons and other hazardous substances and waste discharges from construction sites, camp and equipment community health and issues to with sexually transmitted diseases among others.

The study proposed the following mitigation measures among others:

- Recycling and reuse of construction wastewater wherever possible;
- Use environmentally friendly fuels such as low sulphur diesel
- Install dust screens and maintain them on the buildings as construction progresses above the ground level;
- A concrete washout pit to be used to contain wash water Conducting a RAP;
- Intensive consultation at every stage of the Project;
- Project proponent to work with local existing institution and organizations in dealing with HIV/AIDS as well as creating awareness among workers and community;
- The proponent and contractor should give due consideration to the vulnerable project affected persons including PLWD, the elderly, windows among others
- Adherence to site occupational health and safety rules and regulations as stipulated in the Occupational Safety and Health Act, 2007and Provide all workers on site with the necessary Personal Protective Equipment;
- Adopt waste minimization at source; Monitoring the fate of disposed wastes to ensure they are legally land filled at a recognized controlled site. Adhering to waste management regulations of 2006

1. INTRODUCTION

1.1. Background

Kinsfolk Limited intends to construct residential units in Wangige area along Getathuru Road, Kabete Constituency, Kiambu County. The proposed residential units are comprised of a total of 256 modern apartments divided into three Categories to meet divergent needs and lifestyles of home owners. These categories are one-bedroom apartment, two bedrooms and three bedrooms' apartment. The proposed project will be on Plot L.R No. Kabete /Kibichiko / 3045 located off Ngecha Road along Getathuru Road, in Kibichiko area, Kiambu County.

A Change of User planning briefs have submitted to County Government of Kiambu for the proposed change of use from agricultural to multi-dwelling residential units (Flats).

1.2. Project area and description

The proposed Project is located within Kiambu county. Agriculture is the main economic activity in the area, with maize being the main crop cultivated (this was evident from the large maize plantations observed during the field study).

1.2.1. Project justification

One of the Government of Kenya's (GoK) strategy to promote long-term economic development for its citizens is to catalyze affordable housing. Housing is a basic need besides food and clothing, and its availability for all is an indicator of the state of socioeconomic development of a society. Apart from addressing the basic need for majority of the population, affordable housing (including its value chains) will support economic growth, create jobs, and deepen the financial sector.

The housing sector in Kenya is characterized by inadequate affordable and decent housing, low-level of urban home ownership, extensive and inappropriate dwelling units including slums and squatter settlements. Research shows that Kenya has a housing deficit of over 2 million homes, which increases by approximately 200,000 per annum.

The Government launched an affordable housing programme in 2017 with the goal of providing 500,000 homes over a five-year period as part of the Big Four Agenda. However, about 50,000 new houses are being constructed annually, falling far short of the demand. An estimated 61% of Kenya's 50 million residents live in slums – mainly because of limited supply and unaffordability. Additionally, over 90% of Kenya's urban households live in rental properties. It has also been established that only 2% of the formally constructed houses target lower-income families whereas more than 80% of supply is for upper middle income (48%) and high income (35%).

Kenya's urban population is growing at a rate of 4.4% per year, compared to 3.6% across sub-Saharan Africa. Given this growth and urbanization rate, the housing problem in Kenya is destined to worsen over the next decades if no interventions are made. Additional research has also shown an increase in the number of households coupled with a decrease in the average household size, particularly in Nairobi. Between 2013 and 2019, the total number of households increased from 1.14M to 1.51M, while the household size decreased from an average of 3.2

persons per household to 2.9. These trends are indicative of a sustained and growing demand for smaller sized residential units within the city.

Kinsfolk Limited believes that the low-income market is ready for housing that is affordable and dignified, and that offers unique design and environmental benefits, hence the development proposal.

This ESIA was undertaken to analyse the socio-economic characteristics of the people located within the proposed project area. This was crucial in informing and advising the project proponent in the preliminary and detailed designs of the proposed residential project. The project area is majorly settled by those from Kiambu and Nairobi residents. The project will therefore have a number of impacts both positive and negative to the locals and pedestrians; hence the need of an Environmental Social Impact Assessment (ESIA).

1.3. Project Description

Table 1: Project Description

No	BLOCK	Description	Total Units
1	Block 1 and 2 (1 Bedroom apartments) Basement Parking space	11 floors×4units×2 blocks	88
2	BLOCK 3 and 4 (2 Bedroom apartments). Basement Parking space	10 floors×4units× 2 blocks.	80
3	BLOCK 5 and 6 (3 Bedroom apartments). Basement Parking space	11 floors×4units× 2 blocks	88
TOTAL	**6 Blocks**		**256 Units**

The project will include construction of 6 residential apartment blocks (Block 1 to 6) comprising of two hundred and fifty-six (256) no. units.

- Each of the two (2) blocks of Ground floor to eleventh floor will have a typical plan consisting of; forty-four (44) - one-bedroom apartments units each totaling to eighty-eight (88) no.
- Each of the two (2) blocks of ground floor to tenth floor will have a typical plan consisting of twenty forty (40) - two-bedroom apartment units each totaling to eighty (80) no. of units.
- Each of the two (2) blocks of Ground floor to eleventh floor will have a typical plan consisting of; forty-four (44) - three-bedroom apartments units each totaling to eighty-eight (88) no. units.

1.4. Objectives of the ESIA

The overall aim and purpose of the study was to assess environmental and social impacts that are likely to arise from implementation of the proposed housing project. Specific objectives of the ESIA were to:

- Collect and analyze baseline environmental and socioeconomic data in the study area;

- Identify and assess potential environmental impacts in the design, construction and operation of the proposed project;
- Liaise with interested and affected parties in the area to seek their views on pertinent issues related to the proposed project;
- Identify mitigation measures for the actual and potential adverse impacts; and
- Develop environmental and social management plans suitable for the proposed works, activities and anticipated environmental impacts.

1.5. Baseline data collection

Baseline data was collected on the biophysical and socioeconomic characteristics of the project area. This entailed collection of information on aspects such as topography, local flora and fauna, soils and geology, water resources, drainage, ambient air quality, waste management, settlement patterns, human activities, exiting infrastructure, etc.

2. METHODOLOGY

2.1. Introduction

The ESIA is a statutory requirement, this assessment advocates for sustainable developments taking into consideration the economic, social and environmental impacts associated with them. The social assessment was guided by a broad spectrum of rules which govern and regulate decision making, agreements and laws pertaining to the project affected persons in Kenya. These include: The Constitution of Kenya 2010, which is the supreme law in the country that recognizes the socio-economic and cultural rights of all her citizens as stipulated under article 43. Other relevant statutes include: The National Cohesion and Integration Act, The Kenya Vision 2030 development Policy, National Policy on Gender and Development, Kenya National Youth Policy, National Land Policy and the Draft National Policy on Older Persons and Ageing. The social impact assessment is done as outlined under EMCA Cap 387 which advocates for sustainability of projects. Environment has a wide scope including natural and built environments as well as animals and human environment and their co-existence. Therefore, environmental considerations cannot be made without involving the social impacts which influences human as well as other animals' environment.

2.2. The SIA Principles, Methods and Techniques

The assessment entailed getting background information from documented literature followed by primary data collection from the project area.

2.2.1. Reconnaissance

The methodology used involved preliminary activities and meeting done by the team before the actual assessment. They included reconnaissance visits to the site and also meetings with key stakeholders in the project area. The information obtained was helpful in planning for subsequent fieldworks and other logistics.

The Sociologist was accompanied by an Assistant Sociologist who was also in charge of community meetings and social surveyors. The surveyors were responsible for the survey but were supervised by the Sociologist and assistant sociologist during this exercise.

The key Sociologist and assistant Sociologist first carried out a reconnaissance visit to the area to familiarize themselves with the area, start planning for the bigger study as well as pretesting of questionnaires and making adjustments as required.

2.2.2. Desktop study and literature review

A comprehensive review of literature related to the proposed project and the project area was carried out. The literature included studies on physiography, geology, hydrogeology, water resources and socio-economics of the project area. Relevant policies and legislation on the housing sector and on environmental management were also reviewed.

The Constitution of Kenya 2010; The Kenya Vision 2030; The Kenya National Policy on Gender and Development; Kiambu County Integrated Development Plan (2018-2022), The Kenya National Youth Policy; The Kenya National Land Policy just to name a few formed the basis of legislation review. The consultant also took necessary steps to familiarize with the institutional framework and functions of key government ministries, departments and organizations such as Ministry of Public Works, Youth and Gender affairs, the national gender and equality commission among others.

2.2.3.Field survey

The field survey consisted of three elements as follows:

- Public consultation;
- Observations and
- Photography.

2.2.3.1. Public Consultations

Legal Notice of 101 of June 2003 requires that all environmental and social assessment process in Kenya to incorporate Public Consultation. A requirement informed by awareness that development and implementation of projects can occasion diverse impacts on stakeholders who should consequently be informed appropriately following which they can make informed decision to the proposed development. It is also important to ensure that all stakeholder interests are identified and incorporated in project development, implementation and operation and, against such background, consultation were undertaken far and wide both within the project area and outside with the following objectives;

- To disclose the Study to both primary, secondary and other stakeholders;
- To obtain the reaction/comments/concerns of all stakeholders so as to understand their perceived view of the proposed project and assess the extent to which their views need to be taken into account. This is important as it helps to ensure that important social issues are not overlooked and there is ownership from the communities.

Stakeholder consultations were held with community members to identify what the community perceived of the project so as to get their views and give their recommendations.

2.2.3.2. Socio-economic survey

Stratified random sampling was used to select respondents for the survey. The social experts used Cochran's formulae to determine an appropriate sample size that will be a representation of the actual population. Cochran pointed out that if the population is finite, then the sample size can be reduced slightly. This is due to the fact that a very large population provides proportionally more information than that of a smaller population. It was proposed to use a correction formula to calculate the final sample size in this case which is given below:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Figure 1:Cochrans formulae

Questionnaires were used to collect socio economic data. The data provided information with clear references on but not limited to the following:

- Household demographics, main occupation and composition;
- Vulnerability in project area; disability, aged members and female headed households;
- Education Level;
- Household income; and
- Project acceptability and issues among others.

2.2.3.3. Observations

Observations was used during data collection exercise and also as a means of ascertaining some of the issues raised during the baraza and other interviews. Notable issues such as economic, livelihoods and production systems, land use and settlement patterns and facilities as well as natural resources were all identified through observation and captured using camera. Relevant photographs taken at the project site have been attached to this report.

2.2.4. Data analysis and report writing

Quantitative data was entered into SPSS and MS Excel, they were run to obtain percentages and frequencies of most of the variables. They were then analyzed using content analysis and category building and grouping which enabled the developing of theme relevant to the objectives of the social assessment. The analysis dug into the public's perception of the project's importance, the priority of the negative and positive impacts discussed and others discussed later in this report.

2.3. Objectives of the Social Assessment

The secondary objective of the social assessment was to analyse the characteristic of the people at the proposed Project area.

The primary objectives were as follows:

- Assist the project to support the aspirations and needs of the interested parties in the project area;
- Identify and prepare a comprehensive plan aimed at averting any potential adverse effects due to the proposed project to the locals; and where not feasible/ possible to avert then mitigation and compensation to be done; and
- Ensure that the project's benefits reach the intended group in an equitable manner and through institutions that respect and are able to serve them in a decentralized manner.

3. BASELINE INFORMATION OF PROJECT AREA

3.1. Introduction

Kiambu County is one of the 47 counties in the Republic of Kenya. It covers a total area of 2,543.5 km^2 with 476.3 km^2 under forest cover. Kiambu County borders Nairobi and Kajiado Counties to the South, Machakos to the East, Murang'a to the North and North East, Nyandarua to the North West, and Nakuru to the West.

3.2. Project Location and land ownership

The project site is located on LR.NO Kabete /Kibichiko/3045 in Wangige area Kabete Sub-County, Kiambu County. The site is accessible via Getathuru Road which is approximately 3.86 kilometers from Ngecha Road. The project site initially used to be under agricultural use (Change of use planning brief submitted to Kiambu County Government). The project neighborhood has similar developments such as Talya Suites Kabete and homesteads with small gardens. The neigbourhood is also characterized by Institutions such as Wangige Health Center, Kiambu institute of Hotels and Catering, Kabete subcounty Headquarters, Wangige Primary School, Giggle Friends Kindergarten among others.

The plot is owned by Kinsfolk Limited and measures approximately 2 acres. The site coordinates are 1°13'38.4"S 36°43'29.8"E.

Figure 2: Project site and accessibility

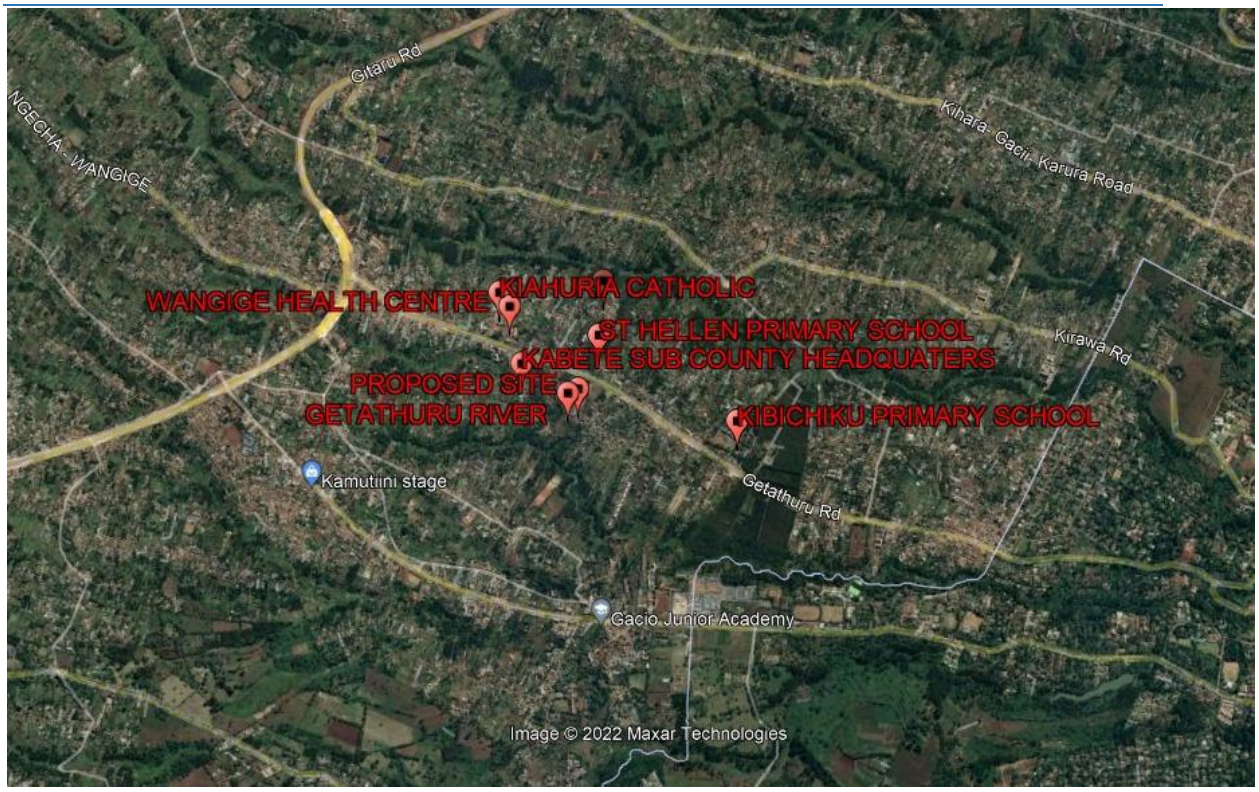


Figure 3: Sensitive receptors within the project area

3.3. Geographic, physical and topographical extent

Kiambu county is divided into four broad topographical zones; Upper Highland, Lower Highland, Upper Midland and Lower Midland Zone. The Upper Highland Zone is found in Lari constituency and it is an extension of the Aberdare ranges that lies at an altitude of 1,800-2,550 metres above sea level. It is dominated by highly dissected ranges and it is very wet, steep and important as a water catchment area. The lower highland zone is mostly found in Limuru and some parts of Gatundu North, Gatundu South, Githunguri and Kabete constituencies. The area is characterized by hills, plateaus, and high-elevation plains. The area lies between 1,500-1,800 metres above sea level and is generally a tea and dairy zone though some activities like maize, horticultural crops and sheep farming are also practiced.

The upper midland zone lies between 1,300-1,500 metres above sea level and it covers mostly parts of Juja and other constituencies with the exception of Lari. The landscape comprises of volcanic middle level uplands. The lower midland zone partly covers Thika Town (Gatuanyaga), Limuru and Kikuyu constituencies. The area lies between 1,200-1,360 metres above sea level. The soils in the midland zone are dissected and are easily eroded. Other physical features include steep slopes and valleys, which are unsuitable for cultivation.

3.4. Water resources, hydrology and drainage

Surface water resources

Numerous rivers mostly emanating from the Aberdare Ranges drain the County which is divided into two major catchments for the Athi and Tana Rivers. The County is divided into several sub-catchments including:

- The Nairobi River sub-catchment which occupies the southern part of the County with major rivers being Nairobi, Gitaru, Gitathuru, Karura, Rui Rwaka, and Gatharaini;
- The Kamiti and Ruiru Rivers sub-catchment which is located to the north of the Nairobi River sub-catchment. It has eight permanent rivers which include Riara, Kiu, Kamiti, Makuyu, Ruiru, Bathi, Gatamaiyu and Komothai;
- The Aberdare plateau which forms two sub-catchments of Thiririka and Ndarugu Rivers. The main streams found in the two areas include Mugutha, Theta, Thiririka, Ruabora, Ndarugu and Komu; and
- The Chania River and its tributaries comprising of Thika and Karimenu Rivers which rise from Mt. Kinangop in the Aberdare ranges

The nearest watercourse to the site is Getathuru. This river is part of the Nairobi River Basin system which consists of numerous streams and rivers originating either in the Ngong Hills or the southern part of the Aberdare mountains flowing from west to east.

The Getathuru River has its source in the highlands just south of Limuru some 26m NW of Nairobi. It passes through Wangige trading centre then along Lower Kabete Valley before passing through Sigiria Forest and the cache location.

Water from the River has been analysed NEMA approved Laboratory (Labworks East Africa Ltd) and the results have been appended to this report.

Plate 1: River Getathuru

Table 2: Water analysis results

First Schedule Water Analysis						
PARAMETER	Method	Results	Guide L & H			Ref. Std Limits (Max)
			Low	Opt.	High	
pH	ISO 10523	7.789				6.5 - 8.5
Total Suspended Solids (TSS), mg/L	APHA 2540	11				30
Total Dissolved Solids (TDS), mg/L	APHA 2540 C	134.70				1200
Nitrates, mg/L	ISO 7890	3				10
Ammonium Nitrogen, mg/L	ISO 11732	0.40				0.5
Nitrites, mg/L	ISO 6777	0.03				3
Flouride, mg/L	APHA 4500F	0.69				1.5
E.coli cfu per 100ml	ISO 9308-1	Nil				Nil
Phenols, mg/L	APHA 5530	0.15				Nil
Arsenic, mg/L	ISO 8288	<0.001				0.01
Cadmium, mg/L	ISO 8288	<0.001				0.01
Lead, mg/L	ISO 8288	<0.001				0.05
Selenium, mg/L	ISO 17379	<0.001				0.01
Zinc, mg/L	ISO 8288	<0.01				1.5
Permanganate Value (pV), mg/L	ISO 8467	Nil				1.0
Alkyl benzyl Sulphonates, mg/L	ASTM D4711	Nil				0.5
Copper, mg/L	ISO 8288	0.18				0.05
Total coliform, cfu/100ml	ISO 9308-1	20				X^2
Chloroform	LWTP 037	Nil				X^2
Free Residual chlorine	LWTP 012	0.01				X^2

3.5. Groundwater resources

There are two main aquifers in the county – the Nairobi Suite and Basement Athi Suite. Most of the ground water exploitation is from the Nairobi Suite which is predominantly volcanic. The project area is considered to be within zones of medium to high groundwater potential. Ground water recharge is from the northwest, and flows occur horizontally through the porous sediments of the Athi series and the fractured system of the tertiary volcanics.

A number of boreholes have been dug within the wider area of Wangige. The depth of these boreholes ranges from 94m – 305m below ground. The struck levels vary from 10m – 207m below ground with water rest level varying from 4.3m – 86m below ground level. Tested yield ranges from 680l/h - 11,400l/h. The wide variation of the tested yields is due to varying drilled depths, aquifer characteristics differences, and differences in borehole designs.

The proponent has done a geotechnical report done for the boreholes that are to be drilled

3.6. Biodiversity

Land use has a significant influence on the biodiversity of an area. It determines the vegetation types and other characteristics such as composition, density and abundance, and in turn, the fauna that can be found in the area.

The Project area is within the rural-urban transition zone where the main land uses are agriculture and settlements. Thus, vegetation is mostly comprised of agricultural crops, agroforestry trees,

and ornamental vegetation around homesteads. The vegetation at the project site includes crops such as maize, beans and vegetables, fruit trees and herbs such as avocado (*Persea americana*) and banana (*Musa* sp.) and other trees such as *Croton macrostachyus.* Various grasses including napier grass (*Pennisetum purpureum*), *Cymbopogon nardus*, and invasives such as *Lantana camara* and *Solanum incanum* are also found on cultivated areas of the plot.

Plate 2: Project area flora presentation

3.7. Ambient air quality and noise levels

The Project site's immediate environs are relatively low density residential cum agricultural areas. The main sources of air pollution are the surrounding agricultural land and earth roads that generate fugitive dust especially under dry conditions. Other sources of emissions include slash and burn activities on agricultural land, and burning of domestic wastes at household level.

The project site is approximately 387m from Ngecha Road, and exhaust emissions from vehicles along the road also affect the ambient air quality.

The probable source of noise in the Project area is vehicular and motorcycle traffic along Ngecha Road. The Getathuru Road is an earth road which is used by the people from the project area. The road is an earth road which may also affect the air quality. Baseline ambient air and noise data was collected in the project area and the data is shown in the tables below:

Plate 3: The Road network to the project site

Table 3: Ambient air quality results

	NO2 (ppb)	O3 (ppb)	PM2.5 (µg/m3)	PM10 (µg/m3)	SO2 (ppb)	TSP (µg/m3)	TVOCs (ppb)
Average	31.25	75.10	6.09	33.897	0.786	56.51	0.02
Maximum	45	88	8	71	5	78	0.18
Minimum	17	56	5	26	0	34	0
Time	10:27:04 - 14:35:07						

Table 4: Noise measurement results

Aspect	dB	Day Stamp
Leq	47.7	
LS(max)	71.7	2022/05/3
LS(min)	31.4	2022/05/3
LPeak(max)	106.1	2021/05/3

Noise Descriptors used for the survey

Ls(max) A-Weighted Maximum sound pressure level obtained during the measurement period. This index is used to describe short period noise events.

Ls(min) A-Weighted Minimum sound pressure level obtained during the period of measurement. This index is used to describe short period noise events.

Leq Value of A-weighted sound pressure level of a continuous steady sound that, within a specified interval, has the same mean square of sound pressure as the sound under consideration whose level varies with time. This index is used to describe events over the period of the event.

dB Decibels

3.8. Energy access

Kiambu County has 98% grid electricity coverage owing to several initiatives such as the 'last mile' and rural electrification programmes. The total households connected to electricity is 70%, and the number is expected to rise to 100% by the year 2022. Solar energy is harnessed by a few in the county, while biogas is widely used especially by farmers in Githunguri, kikuyu, Limuru and other sub-counties where dairy farming is practiced.

The project area is supplied with electric power from KPLC

Plate 4: Power transmission lines next to the project site

3.9. Area and Population

The Project is located in Kibichiku location, Kabete subcounty in Kiambu County. According to the 2019 Kenya Population and housing census, Kiambu County had a population of 2,417,735 people, 49% of whom were male, while 51% were female. Kabete sub-county had a population of 199,653 people, while Kabete ward Location had a population of 30,657. Kibichiku sublocation where the Project is located had 16,126 people in 5,213 households.

The Population density in Kiambu County was 952 people per square kilometer, while Kabete subcounty had a density of 3,289 – the highest among the 12 sub-counties. The number of households in Kabete was 66,710, with an average household size of 3 people. Nyathuna sublocation had a population density of 1,457 people per square kilometer.

3.10. Road Network

The county has a total of 5533 km of roads network. 249 Km of road are yet to be opened. The roads under bitumen standards are 865.4 KMs, 1051km on gravel, 3167km on earth surface. The county is served by Thika Super Highway from Githurai-Ruiru-Juja-Thika on average of 50Kms and A104 Uthiru-Kikuyu-Kamandura- Kinungi on average of 65 which 25.1km of it is on rehabilitation expansion programme. *The proposed project is accessible using Getathuru Road off Ngecha Road.*

3.11. Land use, Land ownership categories and land economy

The main land uses in the County include industrial, agricultural, commercial, and residential uses. The total arable land in the County is 1,878.4 Km^2 of which approximately 21,447Ha is under food crops while 35,367Ha is under cash crops. The main food crops grown in the County include maize, beans, Irish potatoes, bananas and vegetables.

Settlement patterns in Kiambu are either dispersed, linear, or nucleated depending on factors such as land subdivisions, transportation routes, or proximity to trade hubs.

In the project area, settlement patterns are mostly linear along transportation routes. The types of settlements include single user on-farm dwellings and multi-user storied dwellings.

There are three categories of land; public land is approximately 5%, community land 0.01%, whereas private land is approximately 94.99%. Most of the land within the proposed project site is privately owned.

The project site is owned by Kinsfolk Limited on free hold under the land Registration Act.

Plate 5: Land uses neighboring the site

3.11.1. Mean holding size

The average mean holding size of land is approximately 0.045 hectares on small scale and 69.5 hectares on large scale. The small land holdings are mostly found in upper parts of Gatundu North, Gatundu South, Kiambaa, Limuru and Kikuyu constituencies. The large land holdings are usually found in the lower parts of the county especially in Juja constituency and the upper highlands in Limuru and Lari constituencies.

3.11.2. Percentage of land with title deeds

The official land records indicate that 85 per cent of land owners in the Kiambu County have title deeds to their land and there are no recorded cases of incidences of landlessness. The remaining 15 per cent have not received their title deeds. Though 85 per cent of land within the County is registered there are a big number of registered lands that has been subdivided and the titles not registered.

3.12. Main crops produced

The main food crops grown in the county include maize, beans, Irish potatoes, bananas and vegetables. Coffee and tea are the main cash crops grown especially in the upper and lower highlands of the county. The project area has numerous maize plantations.

3.13. HIV&AIDS

According to NASCOP, there were 897,644 adults on treatment in Kenya in 2015. HIV prevalence in Kiambu is comparable to the national prevalence at 5.6% (Kenya HIV Estimates 2015). The HIV prevalence among women in the county is higher (8.2%) than that of men (2.9%) indicating that women are more vulnerable to HIV infection than men in the County. Kiambu County contributed to 4.7% of the total number of people living with HIV in Kenya, and is ranked the sixth highest nationally. By the end of 2015 a total of 70,971 people were living with HIV in the County, with 10% being young people aged 15-24 years and 4% being children under the age of 15 years.

4. STAKEHOLDER IDENTIFICATION AND PUBLIC PARTICIPATION

4.1. Introduction

The principal legislation on environment, the Environmental Management and Coordination (Amended) Act Cap.387, requires an effective stakeholder participation and public consultation in any Environmental and Social Impact Assessment process. Under the Environmental (Impact Assessment and Audit) Regulation of 2003 part 17 (Public Participation); during the process of conducting an environmental impact assessment study under these Regulations, the proponent shall in consultation with the Authority, seek the views of persons who may be affected by the project.

Public consultation and participation is a process through which stakeholders influence and share control over development initiatives, the decisions and resources which affect them. This is held during the project design, implementation/construction and operation of the project. All the affected and interested parties are involved during these stages of the project while furnishing them with all the information on the project required for their benefit as well as discussing sensitive issues with them. Their views, contributions and queries are taken into account as they help in building the ESIA by contributing to the mitigation measures.

4.2. Objectives

The objectives of public participation include:

- Help the development of suitable entitlement alternatives;
- Provision for opportunities for future participation by:
  - Increasing transparency and accountability in decision making.
  - Minimizing conflicts by identification of contentious issues early enough.
  - Pointing out and recognizing local leaders who can lead the process and push for further discourse in consequent stages of the project.
- Increase institutional coordination by sensitization of the project activities while integrating institutional stakeholders' views;
- Enhancement of long term sustainability and ownership of the project;
- To create awareness and garner up support for the proposed project; and
- Provide correct and accurate information regarding the project.

4.3. Stakeholder identification

Stakeholder identification and analysis was carried out to determine who are the project affected people and the most appropriate means of engagement. The methods of engagement ranged from questionnaires, interviews and holding of a public meeting with the local community.

Two main categories of stakeholders were identified, including:

- ***Primary stakeholders***: This group included those who are directly affected by the project either positively or negatively. They therefore include those who reside in the project area.

- ***Secondary stakeholders***: This group included those interested parties with no direct impact from the project. They comprise of respective government agencies, local administration, and County government among others.

4.4. Stakeholder engagement

Stakeholder consultations during the ESIA were carried out to: inform project stakeholders of the proposed project; to explain the likely impacts (positive/negative) of implementing the project; and

to obtain views, concerns, comments and suggestions from interested and affected parties regarding the proposed project.

4.5. Key Stakeholders Consulted

Table 5: Key Stakeholders Consulted

NAME	DESIGNATION	COMMENT
Kibugi Frank Mbugua	Manager Kiambu Institute of Catering and Management	- Social challenges among youth is drug abuse. The contractor should develop a management on alcohol/drugs management. - The project can enhance the spread of HIV/AIDS. This need to be managed through HIV/AIDS control programmes. - Need for continuous stakeholders' engagements during all the project phases
Stephen Nyamai	Director Giggle Friends Kindergarten and Primary School	- The proponent/ contractor to ensure that there are road signs as well because children use the same roads. The road signs will help reduce occurrence of accidents. - The project at implementation stage should engage institutions within the project area at all its phases. The engagement should be a continuous process.
Susan M Gatei	HAO SCHAO	- In support of the propose project - The project will increase the number of patients from young families during the operational phase.
Gerald Muendo	Caretaker Blessed Joseph Alamano CCK	- In support of the project - The contractor should not employ persons under 18 years.
Samuel M Kihuyu	Area Chief Wangige Location	- Youths should be considered for employment.

4.5.1. Public consultation ('baraza')

The proposed residential project is in Kibichiku sub-location and the public consultation were held at the proposed site.

Table 6: Public Participation Schedule

No	Date And Time	Time	Location	Venue	Attendance
1)	5th May 2022	1200hrs-1400hrs	Wangige	Proposed site	23

Issues raised in the public participation were common through the project area, some of them included;

Table 7: Example of Issues raised in public participation

NO	ASPECT	ISSUE ARISING

NO	ASPECT	ISSUE ARISING
1)	Employment opportunities.	The Contractor and the proponent to ensure locals get the opportunity to gain employment, both formal and informal - directly and indirectly from the construction of the proposed project. They asked specifically for; • Area locals to be given unskilled labour minimum 70% and not people from elsewhere. • Local firms, groups and individuals to be subcontracted during the construction e.g., supply of construction materials,
2)	Community Social Responsibilities	A number of CSRs were proposed by the locals; • Consideration to upgrade the access road to fit the new traffic rules and also incorporate bumps. • Integrate security lights around the surrounding environment.
3)	Community Involvement	Locals appreciated the effort by the consultant to involve them, however they requested for continuous participation in every step of the project. The Local leaders and others secondary stakeholders to be involved to ensure that any matters arising are solved in harmony and the project runs smoothly to completion.
4)	Waste management	The locals wanted to know how ensure wastewater generated by the development will be managed. The wastes from the proposed site to be well managed to prevent pollution of the river as well as the neighbourhood.
5)	Water extraction from Getathuru River	Locals wanted to know if there were guidelines on water extraction considering they use water from the river for different domestic uses.

Table 8:Photographic representation of public baraza conducted




5. POLICY, LEGAL AND REGULATORY FRAMEWORK

5.1. Introduction

An overview of the various policies, legal and regulatory framework relevant to the project gives an idea of the various requirements needed by law and as a best practice

5.2. Overview: Policy Framework

5.2.1. Environmental policy

Sessional Paper No. 6 of 1999 on Environment and Development, since adoption by parliament in 1999 has been in use and had influenced the formation of EMCA in 1999. This policy has since been amended to EMCA Cap 387.

The amended draft of the National Environmental Policy, sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources, and recognises that natural systems are under intense pressure from human activities particularly for critical ecosystems including forests, grasslands and arid and semi-arid lands. The objectives of the policy include developing an integrated approach to environmental management, strengthening the legal and institutional framework for effective coordination, promoting environmental management tools.

The project implementers intend to implement the ESMP developed in the ESIA report order to mitigate the perceived social and environmental impacts resulting during the construction and operational phases of the proposed project.

5.2.2. Land policy

The National Land Policy is contained in Sessional Paper No. 3 of 2009. It declares its vision thus, *"To guide the country towards efficient, sustainable and equitable use of land for prosperity and posterity".* It therefore envisages the treatment of all people equitably so that the voices of project affected persons also count. Besides, the policy also recognizes the pre-emptive rights of original property owners as follows, *"the government should confer pre-emptive rights on the original owners or their successor in title where the public purpose or interest justifying the compulsory acquisition fails or ceases".* This protects PAPs from local elites that may use their positions to acquire their land the reason for compulsory acquisition ceases or even stage-manage compulsory acquisition and takeover after declaring change of course of a project. The proposed project should thus make clear to the communities that in the event that right of ways privileges are not actualized, the land will revert to the original owners.

In chapter 2, land policy is linked to constitutional reforms; regulation of property rights is vested in the government by the Constitution with powers to regulate how private land is used in order to protect the public interest. The Government exercises these powers through compulsory acquisition and development control. Compulsory acquisition is the power of the State to take over land owned privately for a public purpose. However, the Government must make prompt payment of compensation.

Chapter 4 of the land policy under Environmental Management Principles, The National Land Policy provides for the policy actions for addressing the environmental problems such as the degradation of natural resources, soil erosion, and pollution. For the management of the urban environment, it provides guidelines to prohibit the discharge of untreated waste into water

sources by industries and local authorities; it also recommends for appropriate waste management systems and procedures, including waste and waste water treatment, reuse and recycling.

The policy goes further to advocate for environmental/social assessment and audit as a land management tool to ensure environmental/social impact assessments and audits are carried out on all land developments that may degrade the environment and have any impact to the people in the area and take appropriate actions to correct the situation. Public participation has been indicated as key in the monitoring and protection of the environment as well as ensuring all social concerns of the affected people are addressed.

Chapter 4 further advocates for the implementation of the Polluter Pays Principle which ensures that polluters meet the cost of cleaning up the pollution they cause, and encourage industries to use cleaner production technologies.

Chapter 6 under land issues requiring special intervention asserts that “Land rights of minority communities shall be protected through a law to be passed specifically to secure their rights as individuals and groups and recognition of their resource management systems to ensure sustainability.” It further states that, “Land rights of vulnerable groups (namely subsistence farmers, pastoralists, hunters and gatherers, agricultural labourers, unskilled workers, unemployed youth, persons with disabilities, persons living with HIV and AIDS, orphans, slum and street dwellers and the aged) shall be addressed by creating a system for identifying, monitoring and assessment, resettling them, facilitating their participation in decision making over land and land based resources, and protecting their land rights”. *The proponent is in full possession of the proposed project plot.*

5.2.3.National Policy on Water Resources Management and Development

While the National Policy on Water Resources Management and Development (1999) 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 neighbourhood and further downstream are not negatively impacted by the emissions. As a follow-up to this, EMCA, 1999 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 EMCA, 1999.

5.2.4.Kenya Vision 2030

Kenya Vision 2030 is the country's development blueprint covering the period 2008 to 2030. It aims at making Kenya a newly industrializing 'middle income country providing high quality life for all its citizens by the year 2030. The vision has been developed through an all-inclusive stakeholder consultative process, involving Kenyans from all parts of the country. The vision is based on three 'pillars' namely; the economic pillar, the social pillar and the political pillar. The vision 2030 comes after the successful implementation of the Economic Recovery Strategy (ERS) for Wealth and Employment Creation 2003-2007.

The Kenya Vision 2030 economic pillar aims at providing prosperity of all Kenyans through an economic development programme aimed at achieving an average GDP growth rate of 10% per annum over the next 25 years from the year 2008. The social pillar seeks to build 'a just and cohesive society with social equity in a clean and secure environment'. On the other hand, the political pillar aims at realizing a democratic political system founded on issue–based politics that respects the rule of law, and protects the rights and freedoms of every individual in the Kenyan society. *The proposed project is geared towards achieving Vision 2030 as it recognizes the need to plan for decent and high-quality urban livelihoods for the population.*

5.3. Overview: Legislative Framework

The Legislative frameworks relevant to the project are discussed below:

5.3.1.The Constitution of Kenya, 2010

The Constitution of Kenya is the basic document and tool that governs Kenya and is committed to nurturing and protecting the well-being of the individual, the family, communities and the nation and recognizing the aspirations of all Kenyans for a government based on the essential values of human rights, equality, freedom, democracy, social justice and the rule of law:

It also advocates for the respect of the environment, which is our heritage, and determined to sustain it for the benefit of future generations. It highlights the basic human rights and fundamental freedoms and is committed to cover and protect the needs of special groups such as the youth, Persons with disabilities and other minority groups.

Persons with disabilities

- A person living with any disability is entitled to be treated with dignity and respect and to be addressed and referred to in a manner that is not demeaning.
- To be integrated into society to the extent compatible with the interests of the person and entitled to reasonable access to all places, public transport and information.
- Entitled to access materials and devices to overcome constraints arising from the person's disability.

Youth

The State shall take measures, including affirmative action programmes, to ensure that the youth

- access employment; and are protected from exploitation
- access relevant education and training; have opportunities to associate, be represented and participate in political, social, economic and other spheres of life

The Proponent will institute measures for environmental protection and prevention of nuisance to the public in construction and operation phase of the Project.

5.3.2.The Environment Management and Coordination Act, Cap 387

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. EMCA 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.

Section 58 of the Act makes it a mandatory requirement for an EIA study to be carried out by proponents intending to implement projects specified in the Second Schedule of the Act. Such projects have the potential of causing significant impacts 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.
This project is categorized under No. 3 Transportation; (a) All roads under the second schedule of the section 58 of the EMCA Cap 387 that list of projects that are to go through an EIA study. EMCA Cap 387 has provided for the development of several subsidiary legislations and guidelines that govern environmental management which are relevant to the current Project. *The proponent has undertaken an Environmental and Social Impact Assessment Study as stipulated under the above-mentioned provisions and developed an ESMP for use before construction, during construction and decommissioning stage.*

5.3.3.The Public Health Act (Cap. 242)
This is an Act of Parliament to make provision for securing and maintaining health. Section 115 of this Act prohibits causing nuisance or other condition liable to be injurious or dangerous to health. Section 118 provides a list of nuisances that includes any noxious matter, or wastewater, flowing or discharged from any premises, wherever situated, into any public street, or into the gutter or side channel of any watercourse, irrigation channel or bed thereof not approved for the reception of such discharge. *The proponent and contractor are recommended to abide by this legal requirement as it will go a long way in fostering good rapport with the community and workers thereby limit conflicts and grievances.*

5.3.4. Water Act 2016
The water act 2016 provides for the management, conservation, use and control of water resources and for acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services. Section 18 of this Act provides for national monitoring and information systems on water resources. Following on this, sub-Section 3 mandates the Water Resources Management Authority to demand from any person or institution, specified information, documents, samples or materials on water resources. Under these rules, specific records may require to be kept by a site operator and the information thereof furnished to the authority.

Section 73 of the Act provides that a person who is licensed to supply water has a responsibility of safeguarding the water sources against degradation. According to section 75 (1) such a person is required to construct and maintain drains, sewers and other works for intercepting, treating or disposing of any foul water arising or flowing upon land for preventing pollution of water sources within his/her jurisdiction.

On the other hand, section 76 makes it an offence for any person to discharge any trade effluent from any trade premises into sewers of a licensee without the consent of the licensee which should be sought by making an application indicating the nature and composition of the effluent, maximum quantity anticipated, flow rate of the effluent and any other information deemed

necessary. The consent shall be issued on conditions including payment of rates for the discharge as provided under Section 77 of the same Act.

Section 94 of the Act also makes it an offence to throw or convey or cause or permit to be thrown or conveyed, any rubbish, dirt, refuse, effluent, trade waste or other offensive or unwholesome matter or thing into or near to water resource in such a manner as to cause, or be likely to cause, pollution of the water resource.

This Act provides for measures for the conservation of groundwater in order to protect public water supplies. *The main contractor will be required to implement necessary measures to ensure water conservation and also to prevent potential for water contamination during the construction phase.*

Proponent will apply for an abstraction permit to use the groundwater in case there will be one and also to conduct tests on neighboring water sources.

5.3.5.Building Code 2000

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 bylaws. 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

5.3.6. 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 neighbourhoods or those passing along a public way. *The 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*

5.3.7.Urban Areas and Cities Act No. 13 of 2011

This Act came into operation on the repeal of the Local Government Act (Cap. 265) as per section 1(2) Subject to subsection (3); this Act shall come into operation after the first elections held under the Constitution. (3) Part VIII of this Act shall come into operation on the repeal of the Local Government Act (Cap. 265). According to this act a town retains its town status as per the requirements needed for an area to be conferred a town, this is in accordance to section 54. Assessment and classification of existing urban areas and cities (1) during the transition period assessment shall be undertaken on the existing urban areas and cities in order to ascertain whether they meet the criteria for classification as urban areas or cities under this Act,

and shall be classified accordingly*. The project is within Kiambu county and is approximately 1km from Wangige shopping centre. The proposed project aims to improve the living standards.*

5.3.8.The County Governments Act (Amendment) No. 4 of 2017

The local government act was repealed after the final announcement of all the results of the first elections held under the Constitution as per the County Governments Act of 2012. Under section 134 subsection (1), The Local Government Act is repealed upon the final announcement of all the results of the first elections held under the Constitution. Its further states in section 134, subsection (2) reads "All issues that may arise as a consequence of the repeal under subsection (1) shall be dealt with and discharged by the body responsible for matters relating to transition". The Project will according to the County Government act of 2012 ensure that the Project activities conform to the regulation that shall be passed.(section 135 (1) The Cabinet Secretary may make regulations for the better carrying out of the purposes and provisions of this Act and such Regulations may be made in respect of all county governments and further units of decentralization generally or for any class of county governments and further units of decentralization.) comply to the set regulations and by laws. *This is the primary law governing the development within counties and thereby will be crucial during implementation of the Project. The proponent intends to work hand in hand with Kiambu County Government and the representatives have been part of the earlier key stakeholder consultations.*

5.3.9. Work Injury Benefits Act (WIBA), 2007

It is an act of Parliament to provide for compensation to workers for injuries suffered in the course of their employment. It outlines the following:

- Employer's liability for compensation for death or incapacity resulting from accident;
- Compensation in fatal cases;
- Compensation in case of permanent partial incapacity;
- Compensation in case of temporary incapacity;
- Persons entitled to compensation and methods of calculating the earnings;
- No compensation shall be payable under this Act in respect of any incapacity or death resulting from a deliberate self-injury;
- Notice of an accident, causing injury to a workman, of such a nature as would entitle him for compensation shall be given in the prescribed form to the director.

The contractor is encouraged to abide by all the provisions of WIBA. All the necessary measures in accordance to SMP will be undertaken to ensure that accidents are minimized (Zero accidents policy) however employees will need to be insured to facilitate compensation modalities in case of injury.

5.3.10. HIV/AIDS Prevention and Control

PART II – *HIV and AIDS education and information*

The Government shall promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS through a comprehensive nationwide educational and information campaign conducted by the Government through its various Ministries, Departments, authorities and other agencies.

- In conducting the educational and information campaign referred to in this section, the Government shall collaborate with relevant stakeholders to ensure the involvement and participation of individuals and groups infected and affected by HIV and AIDS, including persons with disabilities

HIV and AIDS education in the workplace:

The Government shall ensure the provision of basic information and instruction on HIV and AIDS prevention and control to:

- employees of all Government Ministries, Departments, authorities and other agencies; and employees of private and informal sectors

HIV and AIDS information in communities:

Every Local Authority, in collaboration with the Ministry, shall conduct an educational and information campaign on HIV and AIDS within its area of jurisdiction. *The contractor and proponent to abide by this regulation especially during the construction phase.*

5.3.11. The Occupational Safety and Health Act, 2007

This is an Act of Parliament to provide for the safety, health and welfare of all 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. It applies to all workplaces where any person is at work, whether temporarily or permanently. The purpose of this Act is to:

- Secure the safety, health and welfare of persons at work;
- Protect persons other than persons at work against safety and health arising out of, or in connection with the activities of persons at work.

The Occupational Safety and Health Act 2007 (OSHA 2007) Kenya Gazette Supplement No.111 (Acts No.15) dated October 26, 2007 revokes the Factories and Other Places of Work Cap.514.

The scope of OSHA 2007 has been expanded to cover all workplaces including construction, offices, schools, academic institutions, factories, and plantations. It establishes codes of practices to be approved and issued by the Directorate of Occupational Safety and Health Services (DOSHS) for practical guidance of the various provisions of the Act.

Section 12 of the Act. (1) Every self-employed person shall— take all necessary precautions to ensure his own safety and health and that of any other person in his workplace or within the environs of his workplace; at all times use appropriate safe systems of work, preventive and control measures and where not feasible, use suitable personal protective appliances and clothing required under this Act; comply with any safety and health rules, regulations instructions and procedures issued under this Act; report any situation which he has reason to believe would present imminent danger or hazard and which he cannot correct, any incident or injury that arises in the course of or in connection with his work, as required under this Act. A self-employed person who contravenes the provisions of this section commits an offence.

Section 13 states that.(1) Every employee shall, while at the workplace— ensure his own safety and health and that of other persons who may be affected by his acts or omissions at the workplace; co-operate with his employer or any other person in the discharge of any duty or requirement imposed on the employer or that other person by this Act or any regulation made hereunder; at all times wear or use any protective equipment or clothing provided by the employer for the purpose of preventing risks to his safety and health; comply with the safety and health procedures, requirements and instructions given by a person having authority over him for his own or any other person's safety; report to the supervisor, any situation which he has reason to believe would present a hazard and which he cannot correct; report to his supervisor any accident or injury that arises in the course of or in connection with his work; and with regard to any duty or requirement imposed on his employer or any other person by or under any other relevant statutory provision, co-operate with the employer or other person to enable that duty or requirement to be performed or complied with. An employee who contravenes the provisions of this section commits

an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand shillings or to imprisonment for a term not exceeding three months or to both. Duty to report any dangerous situation.

Section 14 states that (1) Every employee shall report to the immediate supervisor any situation which the employee has reasonable grounds to believe presents an imminent or serious danger to the safety or health of that employee or of other employee in the same premises, and until the occupier has taken remedial action, if necessary, the occupier shall not require the employee to return to a work place where there is continuing imminent or serious danger to safety or health. (2) An employee who has left a work place, which the employee has reasonable justification to believe presents imminent and serious danger to life and health shall not be dismissed, discriminated against or disadvantaged for such action by the employer. (3) It shall be an offence for a person on whom a duty is imposed under this section to fail to carry out that duty. Duty not to interfere with or misuse things provided pursuant to certain provisions.

Section 15. A person who wilfully interferes with or misuses any means, appliance, convenience or other thing provided or done in the interests of safety, health and welfare in pursuance of this Act commits an offence and shall, on conviction, be liable to a fine not exceeding one hundred thousand shillings for to imprisonment for a term not exceeding three months or to both. Prohibition against creation of hazards.
Section 16. States that (1) No person shall engage in any improper activity or behaviour at the workplace, which might create or constitute a hazard to that person or any other person. (2) For purposes of this section, improper activity or behaviour includes boisterous play, scuffling, fighting, practical jokes, unnecessary running or jumping or similar conduct.

Section 17 on General duties of occupier and self-employed to persons other than their employees. States that. (1) Every occupier shall conduct his undertaking in such a manner as to ensure, that a person who is not his employee who may be affected thereby is not exposed to risks to safety or health.(2) Every self-employed person shall conduct his undertaking in such a way as to ensure that he and any other person who is not his employee who may be affected thereby is not exposed to risks to safety or health.(3) It shall be the duty of every employer and every self-employed person to give relevant safety and health information to every person, not being his employee who may be affected by the manner in which the employer or the self-employed person conducts his undertaking, on such aspects of the way he conducts his business as may affect safety or health.(4) It shall be an offence for a person on whom a duty is imposed under this section to fail to carry out such a duty.

Section 18 on Duties of an occupier of a place of work to persons other than his employee s.(1) An occupier of non-domestic premises which have been made available to persons, not being his employees, as a place of work, or as a place where the employee s may use a plant or substance provided for their use there, shall take such measures as are practicable to ensure that the premises, all means of access thereto and egress there from available for use by persons using the premises, and any plant or substance in the premises provided for use there, are safe and without risks to health.(2) A person who has, by virtue of a contract, lease or otherwise, an obligation of any extent in relation to the:
(a) Maintenance or repair of a place of work or any means of access thereto or egress there from; or
(b) Prevention of risks to safety and health that may arise from the use of any plant or substance in the place of work, shall for the purpose of subsection (1), be deemed to have control of the matters

to which his obligation extends. (3) It shall be an offence for a person on whom a duty is imposed under this section to fail to carry out such a duty.

Section 19 on General duty of persons in control of certain premises in relation to harmful emissions into atmosphere. (1) An occupier of any premises likely to emit, poisonous, harmful, injurious or offensive substances, into the atmosphere shall use the best practicable means to—
(a) Prevent such emissions into the atmosphere; and
(b) Render harmless and inoffensive the substances which may be emitted.
(2) The reference in subsection (1) to the means to be used for the purpose of that section includes a reference to the —
(a) Manner in which the plant provided for those purposes is used; and
(b) Supervision of any operation involving the emission of substances to which that subsection applies.
(3) An occupier who contravenes the provisions of this section commits an offence.

The contractor should register the workplace with the Directorate of Occupational Health and Safety and comply with all the legal provisions stipulated in the OSHA 2007 as stated above and Proponent will commit the contractor to implementing a health and safety plan that ensures protection of both workers and the general public from safety hazards

5.3.12. Land Tenure and Land Use Legislation

The Kenya constitution, which is the basic law of the land provides for protection of private property from deprivation without lawful compensation. The constitution also provides that such property may be “acquired if it is necessary in the interest of defence, public security, and public morality”. Land is a crucial national resource that is basic to the livelihood and well-being of Kenyans. The following are some of the main statutes that regulate land ownership and land use in Kenya: *The proponent will strive to adhere to this legislation in regards to land use and acquisition if need be.*

5.3.12.1. The Land Act (Amendment) No. 28 of 2016

The land laws (Amendment) of 2016 were done on the principal land Act No. 6 of 2012. This is an Act of Parliament to give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws; to provide for the sustainable administration and management of land and land-based resources, and for connected purposes. It has repealed the Way leaves Act, Cap. 292; and the Land Acquisition Act, Cap. 295.

The Act identifies the following forms of land tenure:

a) Freehold;
b) Leasehold;
c) Such forms of partial interest as may be defined under this Act and other law, including but not limited to easements; and
d) Customary land rights, where consistent with the Constitution.

The Act outlines methods of acquisition of title to land, which include: (a) allocation; (b) land adjudication process; (c) compulsory acquisition; (d) prescription; (e) settlement programs; (f) transmissions; (g) transfers; (h) long term leases exceeding twenty-one years created out of private land; or (i) any other manner prescribed in an Act of Parliament.
Section 9 gives provision for conversion of land from one category to another in accordance with the provisions of this Act or any other written law.

Section 9 (2) (c) outlines ways in which private land may be converted to public land, this may be through:

i. Compulsory acquisition;
ii. Reversion of leasehold interest to Government after the expiry of a lease; and
iii. Transfers; or
iv. Surrender

The proposed project site is a private land and the proponent has in possession a land ownership document.

5.3.13. The Roads Act, 2007

The Roads Act 2007 aims at harmonizing the duties and functions relating to the construction and maintenance of Roads in Kenya previously exercised at National and Local Government levels through the Ministry of Roads and Public Works and the various Counts of the Republic of Kenya. The Act also decentralizes the affairs relating to roads management, development, rehabilitation and maintenance to three stakeholders namely the National, Rural and Urban levels, and the creation of an Authority at each level. *The proposed project will use existing road corridors in Kiambu County*.

5.3.14. The Traffic Act, Cap 403

This Act specifies that motor vehicles use proper fuel. The Traffic regulations promulgated under the Act specifies that every vehicle is required to be so constructed, maintained and used so as not to emit any smoke or visible vapour.

The Act also empowers police officers to stop and remove from the road vehicles producing noxious emissions or to charge their owners in a court of law. Pollution of the atmosphere occurs on the road either by use of adulterated petroleum products or un-roadworthy vehicles. The Act requires that the vehicles shall only use the fuel specified in the vehicle license, but does not specify air pollution/quality standards. *The contractor should abide by this regulation especially during construction phase in regards to vehicles that will be used to ferry materials.*

5.3.15. Kenya National Commission on Human Rights No. 14 of 2011

An Act of Parliament to restructure the Kenya National Human Rights and Equality Commission and to establish the Kenya National Commission on Human Rights pursuant to Article 59(4) of the Constitution; to provide for the membership, powers and functions of the Kenya National Commission on Human Rights, and for connected purposes

In fulfilling its mandate, the Commission shall act in accordance with the values and principles set out in the Constitution and the Laws of Kenya, and shall observe and respect—

a) the diversity of the people of Kenya;
b) impartiality and gender equity;
c) all treaties and conventions which have been ratified in Kenya and in particular the fact that human rights are indivisible, interdependent, interrelated and of equal importance for the dignity of all human beings;
d) and the rules of natural justice

The functions of the Commission shall be to—

- promote respect for human rights and develop a culture of human rights in the Republic;

- promote the protection and observance of human rights in public and private institutions;
- monitor, investigate and report on the observance of human rights in all spheres of life in the Republic;
- receive and investigate complaints about alleged abuses of human rights, except those relating to the violation of the principle of equality and freedom from discriminations under the gender and equality commission, and take steps to secure appropriate redress where human rights have been violated;
- on its own initiative or on the basis of complaints investigate or research matter in respect of human rights, and make recommendations to improve the functioning of State organs;
- act as the principal organ of the State in ensuring compliance with obligations under international and regional treaties and conventions relating to human rights except those that relate to the rights of special interest groups protected under the law relating to equality and non-discrimination;
- formulate, implement and oversee programmes intended to raise public awareness of the rights and obligations of a citizen under the Constitution;
- work with the National Gender and Equality Commission and the Commission on Administrative Justice to ensure efficiency, effectiveness and complementarity in their activities and to establish mechanisms for referrals and collaboration;
- perform such other functions as the Commission may consider necessary for the promotion and protection of human rights; and
- perform such other functions as may be prescribed by the Constitution and any other written law.

5.3.16. National Gender and Equality Commission Act, 2011

An Act of Parliament to establish the National Gender and Equality Commission as a successor to the Kenya National Human Rights and Equality Commission pursuant to Article 59(4) of the Constitution; to provide for the membership, powers and functions of the Commission, and for connected purposes.

The functions of the Commission shall be to —

a. promote gender equality and freedom from discrimination in accordance with Article 27 of the Constitution;
b. monitor, facilitate and advise on the integration of the principles of equality and freedom from discrimination in all national and county policies, laws, and administrative regulations in all public and private institutions;
c. act as the principal organ of the State in ensuring compliance with all treaties and conventions ratified by Kenya relating to issues of equality and freedom from discrimination and relating to special interest groups including minorities and marginalized persons, women, persons with disabilities, and children;
d. co-ordinate and facilitate mainstreaming of issues of gender, persons with disability and other marginalised groups in national development and to advise the Government on all aspects thereof;
e. monitor, facilitate and advise on the development of affirmative action implementation policies as contemplated in the Constitution;

f. investigate on its own initiative or on the basis of complaints, any matter in respect of any violations of the principle of equality and freedom from discrimination and make recommendations for the improvement of the functioning of the institutions concerned;
g. work with other relevant institutions in the development of standards for the implementation of policies for the progressive realization of the economic and social rights specified in Article 43 of the Constitution and other written laws;
h. co-ordinate and advise on public education programmes for the creation of a culture of respect for the principles of equality and freedom from discrimination;
i. conduct and co-ordinate research activities on matters relating to equality and freedom from discrimination as contemplated under Article 27 of the Constitution;
j. Receive and evaluate annual reports on progress made by public institutions and other sectors on compliance with constitutional and statutory requirements on the implementation.

5.4. Institutional framework

In 2001, the Government established the administrative structures to implement the Environmental Management and Co-ordination Cap 387, (herein referred to as the Act). Environment covers all issues relating to the interdependency of all organisms and their natural and built environment, so it encompasses the social wellbeing of human as well.

5.4.1.The National Environment Management Authority

The responsibility of NEMA is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government in the implementation of all policies relating to the environment. The Authority gives licenses to any development project once it reviews environmental and social impact assessment reports prepared (this study report) so as to assess the possible impacts of the proposed project as well as give mitigation measures to ensure protection and sustainability of the environment and the development. *The ESIA will be submitted to NEMA for approval and the Authority will be responsible for supervision to ensure applied conditions are abided by contractor/proponent.*

5.4.2.National Complaints Environment Committee

This Committee is tasked with undertaking public interest litigations on behalf of the citizens in environmental matters. It also investigates any allegations/complaints against any person or against the Authority in relation to conditions of the environment in Kenya; the committee prepares and submits to the Council periodic reports of its activities which form part of annual report on the state of the environment. *This committee investigates complaints regarding environment and public interest litigations; contractor to abide by ESMP developed.*

5.4.3.County Environment Committee

The County Environmental Committees contribute to decentralised environmental management and enable the participation of local communities. These committees are responsible for the proper management of the environment within the county, develop a county strategic environmental action plan every five years and perform any additional functions as are prescribed by the Act or as may, from time to time be assigned by the minister by notice in the gazette.
These environmental committees consist of the following:

- Representatives from all the line ministries;
- Representatives from Sub-counties;
- Two farmers / pastoral representatives;

- Two representatives from NGOs involved in environmental management in the County/ Sub counties;
- A representative of each regional development authority in the province/district.

The Kiambu County Environment Committee is responsible for proper management of environment within the County; the Contractor to ensure they abide with set conditions in approval NEMA license and ESMP.

5.4.4.Ministry of Public Service, Youth and Gender Affairs

The Ministry is charged with the coordination of among others the empowerment programmes for the youth, women in the country. It is also the docket charged with promoting gender equity in the country.

5.4.5.National Gender and Equality Commission

The commission works with, partners, communities and other stakeholders to promote mainstreaming of issues of minorities and marginalized communities and groups in all spheres of development. Its focus areas include:

- Undertaking public education and information to sensitize minorities and marginalized and stakeholders on integration of the principles of equality and freedom from discrimination.
- Monitoring, auditing, and advising on the development and implementation of affirmative action policies and programmes on issues of minority and the marginalized.
- Enhancing the participation and inclusion of minority and the marginalized in all aspect of county and national development.
- Monitoring the performance levels of public and private institutions, county and national governments on mainstreaming issues of minority and the marginalized, including representation and involvement in decision making and leadership positions and issue advisories.

5.4.6.Kiambu County Government

The Kiambu County Government will be key implementers on the ground in line with constitutional functions of county governments. The functions of the county government relevant to the proposed project, as outlined in the Fourth Schedule, Constitution of Kenya 2010 are as follows: Provision of essential services such health services, county transport, education; Control pollution and disasters management; public entertainment and public amenities; County planning and development; County public works and services; Implementation of specific national government policies on natural resources and environmental conservation; and Encourage public participation in county governance and development

The county government of Kiambu will be coordinating the project implementation.

5.4.7.National Youth Council

The Council was set up and charged with the mandate of looking into youth affairs. Some of Its few functions include

- facilitate the periodic review of the National Youth Policy in line with other government policy statements;
- mobilize resources to support and fund youth programmes and initiatives;
- lobby for legislation on issues affecting the youth;

- liaise with other organizations to ensure that the youth gain access to resources and services appropriate to their needs;
- promote relations between youth organizations and other bodies both nationally and internationally with similar objectives or interests;
- inspire and promote the spirit of unity, patriotism, volunteerism and service among the youth;
- formulate operational guidelines that protect the youth against any form of abuse or manipulation;
- promote the inclusion of youth agenda in the formulation of policy by public institutions and organizations;
- promote the inclusion of youths in decision-making bodies, boards, agencies and other public institutions and organizations;
- act as a voice and bridge to ensure that the Government and other policy makers are kept informed of the views and aspirations of the youth;

The council is expected to exercise its powers and functions in the proposed project to push for the youth agenda especially with regards to employment and business opportunities.

6. SOCIO ECONOMIC BASELINE SURVEY

6.1. Introduction

In studying the socio-demographic structure and dynamics of the project area, the team concentrated on inquiring into the population structure (age, sex and other compositional characteristics) and dynamics (income activities, income levels) of the inhabitants. We emphasised the educational, occupational and work statuses of the population of the settlements. In collecting the socio-economic data, the following three main methods were used namely:

- Questionnaire
- In-depth Interview (IDI)
- Observation

Desktop study and Document review

- A host of related literature and documents which formed the basis of the literature review and secondary data analysis were reviewed. The documents under review included the County Integrated Plan and the National Household and Demographic Census.
- Based on the population for the project area, Kibichiku sublocation where the Project is located had 16,126 people. The experts used Cochran's formulae to determine an appropriate sample size that will be a representation of the actual population. Cochran pointed out that if the population is finite, then the sample size can be reduced slightly. This is due to the fact that a very large population provides proportionally more information than that of a smaller population. He proposed a correction formula to calculate the final sample size in this case which is given below:

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Figure 4: Cochran's formulae

Here, n_0 is the sample size derived from equation on unknown population size which is 200 and N is the population size (16,126). At 95% confidence level n_0 is 198.

Sample Survey

- A team of six social surveyors appointed, trained and a pilot survey undertaken to improve on results and their comprehension of what was required of them.
- A total of **205** questionnaires were administered and the data entered into the SPSS Programme for analysis.

6.2. Respondents Information

6.2.1. Respondent relation to household head

A majority of the respondents approached were household heads (72%) followed by spouse (24%) the least was child at 1%.

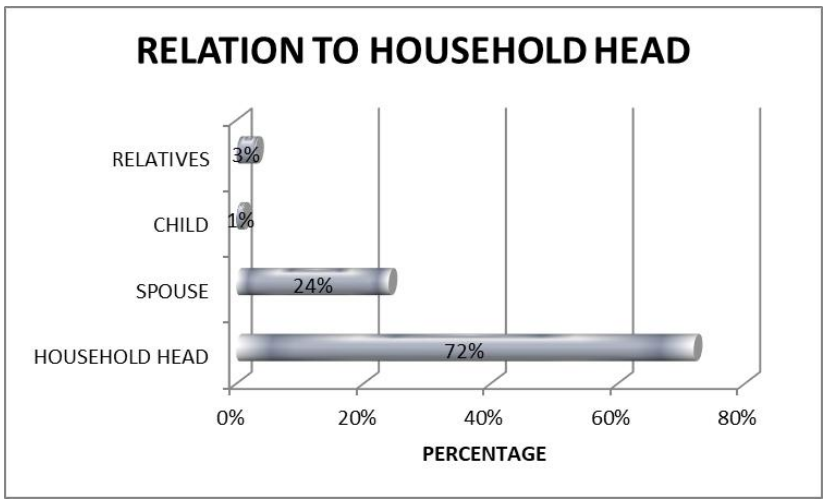


Figure 5:Relation to household head

6.2.2.Respondents Gender

The study approached more females (56%) as compared to males (44%). *The project proponent should therefore factor in gender-based programs which aim at including females who might be under-represented though they are the majority in regards to project implementation and benefits*

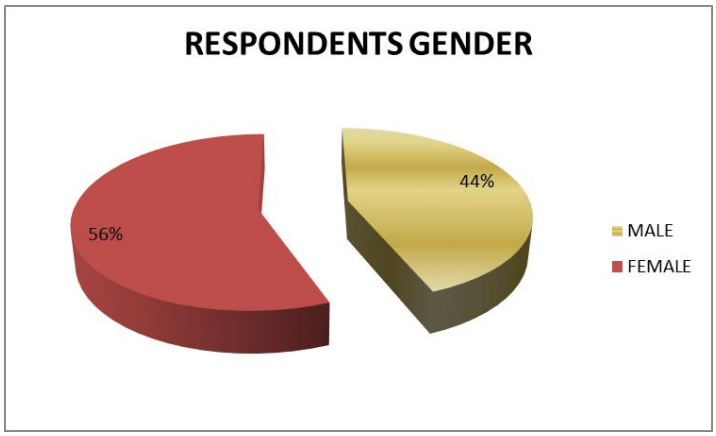


Figure 6:Respondents Gender

6.2.3.Respondents Age

From the study, most of the respondents were aged between 46-50years (14.90%) followed by 26-30 years and above 71 years (9.38%) the least was 18-21 years (1.92%).

Persons aged 60 and above are considered as vulnerable, they accounted for 22.36%. They should be identified and accorded necessary assistance and support during the project's implementation.

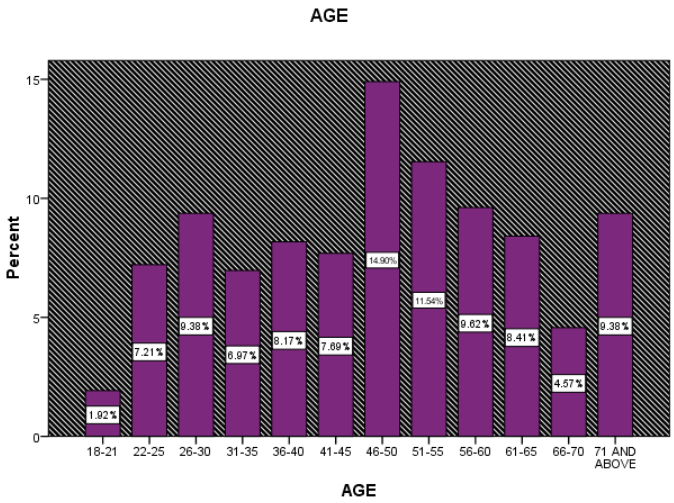


Figure 7: Respondents age

6.2.4.Civil Status

Married people in the project area accounted for the majority (57.35%) followed by single (20.72%), widow (15.66%) the least was divorced (0.98%)

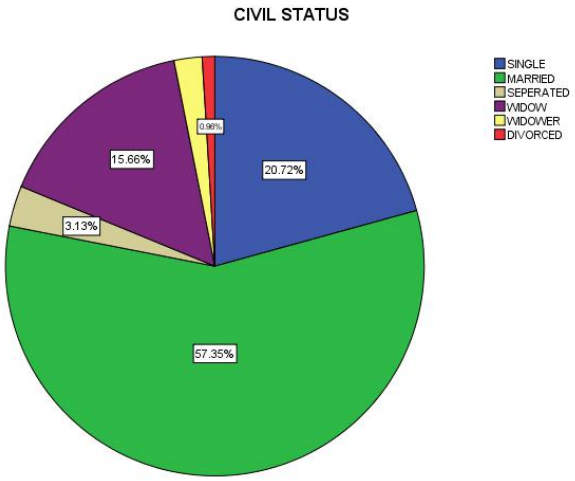


Figure 8: Civil status

6.2.5.Educational Attainment

From the study, 36.79% of the respondents were high school graduates followed by 21.93% who were college graduates. Only 4.44% lacked any form of education

A significant number of the respondent are literate; this implies that the project's community members can be involved at various levels while implementing the projects given that they will understand factor involved and the concept.

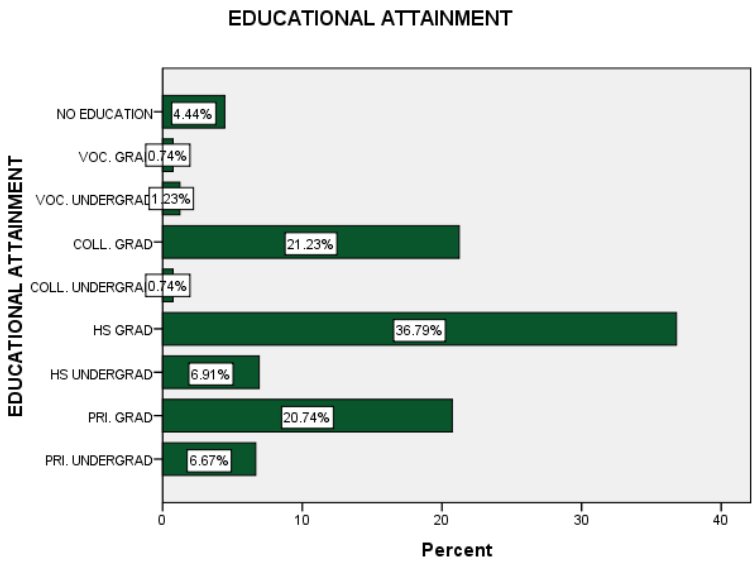


Figure 9:Educational attainment

6.3. Household Information

6.3.1.Place of Origin

The respondents were asked prior to them settling within the project area if they had been in another area, according to 70% they originate from within the location will 30% originated from outside the location

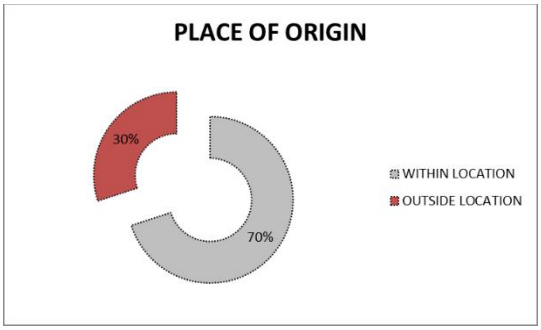


Figure 10: Place of Origin

6.3.2.Length of Residence in the area.

The question on length of residency in project area sought to support the previous question on place of origin. Most of the respondents have stayed in their current location for 31 years and above (40.63%), followed by 1-5years 11.54% while 2.88% have stayed for 5year and below.
This finding corroborates the earlier finding that project area is mainly occupied by community members on ancestral lands; there is therefore need to factor other intangible impacts that may arise. The project team will also benefit on the fact that most of the residents in the area have stayed in area for long therefore know each other well and any issue/conflict that may arise can be addressed through consultation.

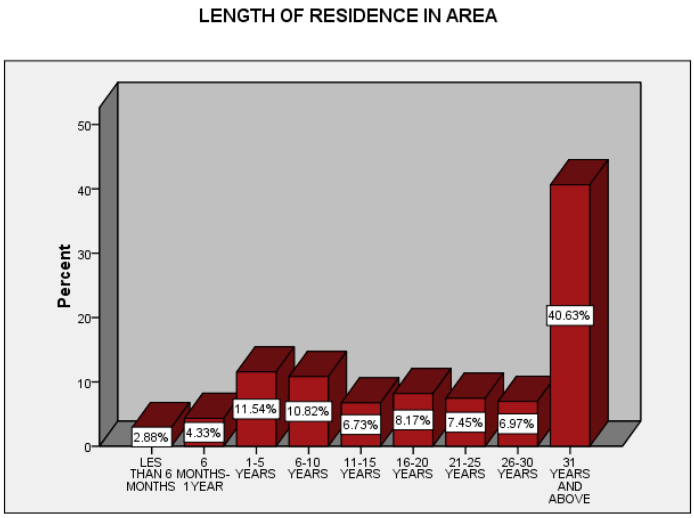


Figure 11: Length of residence in the area

6.3.3.Primary Occupation

From the study, Business person were the highest (58.65%) followed by crop production (25.48%) then mixed farming (10.59%) the least was casual employment (1.44%).
The proposed project site is approximately 1km from Wangige shopping Centre and there were kiosks beside the road. The area is made up of agricultural lands as well.

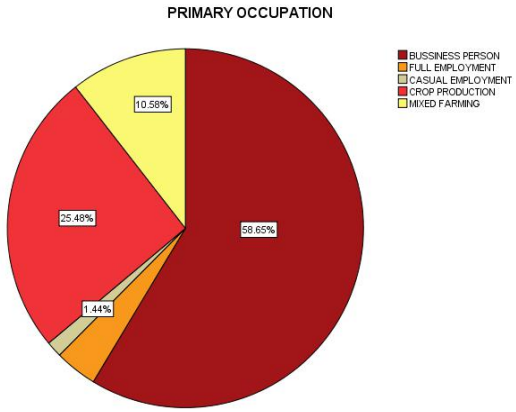


Figure 12: Primary Occupation

6.3.4.Reasons for establishing residence in the area

Asked what influenced their settlement in the current location 31.7% indicated social reasons, 60.5% economic reasons while 7.8% other reasons. The main social reason for selection of settlement was getting married (66%) followed by to be with family (33%); main economic reason for selection of settlement was proximity of livelihood (83%) followed by affordable rent (12%); other main reason for settlement was security at 79% followed by bought land 17%.

When looked from a general perspective the settlement pattern in urban areas of the project area is influenced by proximity to livelihood. Whereas in rural areas it is mainly based on social considerations such as to be with family and ancestral lands.

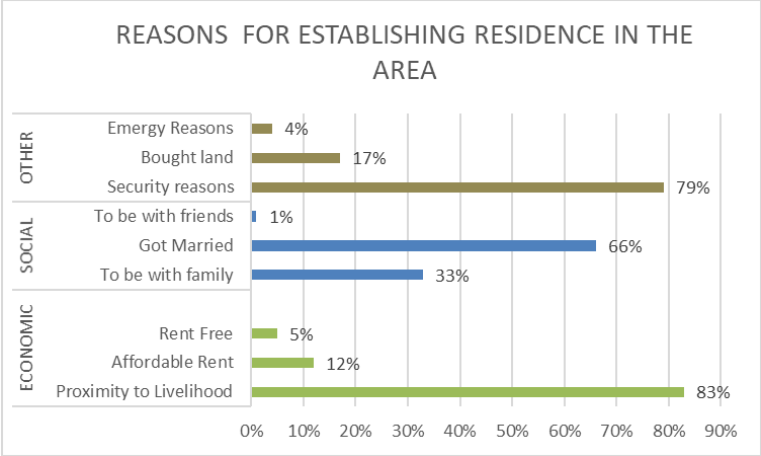


Figure 13:Reasons for establishing residence in the area

6.3.5.Ethnic Group

The main ethnic group in project area is Kikuyu (88.92%) followed by Kamba (3.13%), Kisii and Luo was 1.69% each, Meru 1.20% the least was luhya at (0.96%). T*his to appreciate the cosmopolitan nature of the area and cultural considerations in the area.*

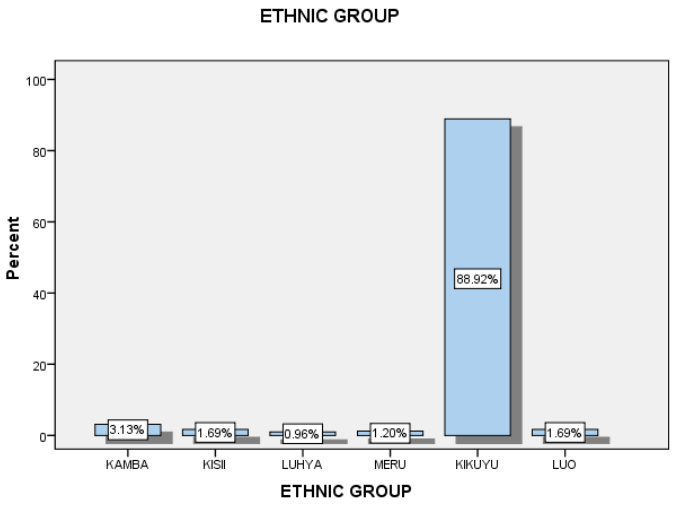


Figure 14: Ethnic Group

6.3.6.Methods of Information Sharing

The most preferred method of information sharing was chief baraza (63%) followed by church gatherings (24%), public gathering and seminars were at 5% the least was others (3%). Methods listed in 'others' included making of phone calls and door to door consultations.

The project team can utilize some of the existing methods identified above especially chief baraza in disseminating information concerning the project.

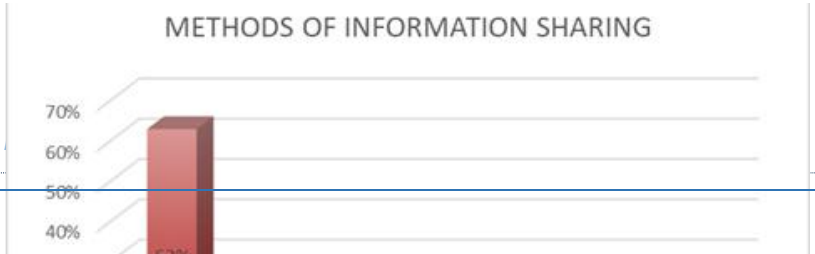


Figure 15:Methods of Information Sharing

6.3.7.Household Size

The mean household size was 5.17 with standard deviation of plus or minus 3.337. The household size is between one and ten members.

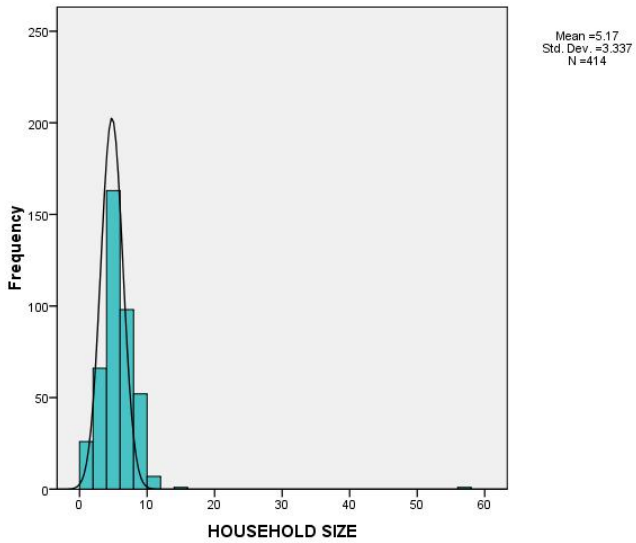


Figure 16: Household size

6.3.8.Type of Family Living

Nuclear was the most common type of family living in the project area (80%), extended family was at 20%.

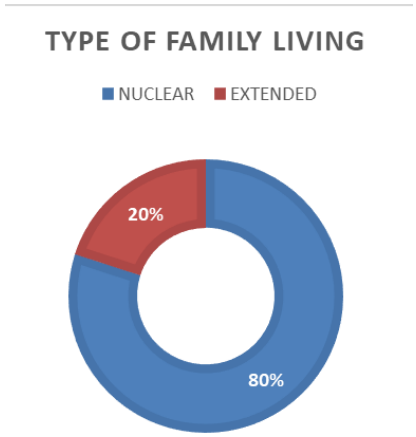


Figure 17: Type of family living

6.3.9.Financial, physical, spiritual and emotional help

In most communities there exist informal arrangements which seek to help neighbours and friends cope with shocks, tragedies and to prevent the poor or those vulnerable from going to depression. The study sought to establish the persons frequently asked for help during times of need. Financial help was mainly provided by spouse (53.58%) followed by male sibling (14.33%). Physical was mainly provided by spouse (46.25%) followed by male siblings (16.61%). Spiritual help was mainly provided by spouse (32.47%) followed by female sibling (10.39%). Emotional help was mainly provided by spouse (38.81%) followed female sibling and female non relative (10.76%).

Table 9: Financial, physical, spiritual and emotional help

		column n %
FINACIAL HELPER	spouse	53.58%
	male sibling	14.33%
	female sibling	4.78%
	male relative	13.31%
	female relative	5.46%
	male non relative	
	female non relative	2.05%
PHYSICAL HELPER	spouse	46.25%
	male siblings	16.61%
	female siblings	6.84%
	male relative	10.75%
	female relative	4.56%
	male non relative	6.84%
	female non relative	8.14%
SPIRITUAL HELPER	spouse	34.27%
	male sibling	2.25%
	female sibling	10.39%
	male relative	5.34%
	female relative	9.83%
	male non relative	29.78%
	female non relative	8.15%
EMOTIONAL	spouse	38.81%

HELPER	male sibling	2.55%
	female sibling	10.76%
	male relative	4.82%
	female relative	9.63%
	male non relative	22.66%
	female non relative	10.76%

6.3.9. Family Decision Making

The survey sought to understand who the decision makers are with regards to livelihood, family decisions, financial decisions and community affairs. In the project area most of the decisions are made by both the husband and wife.

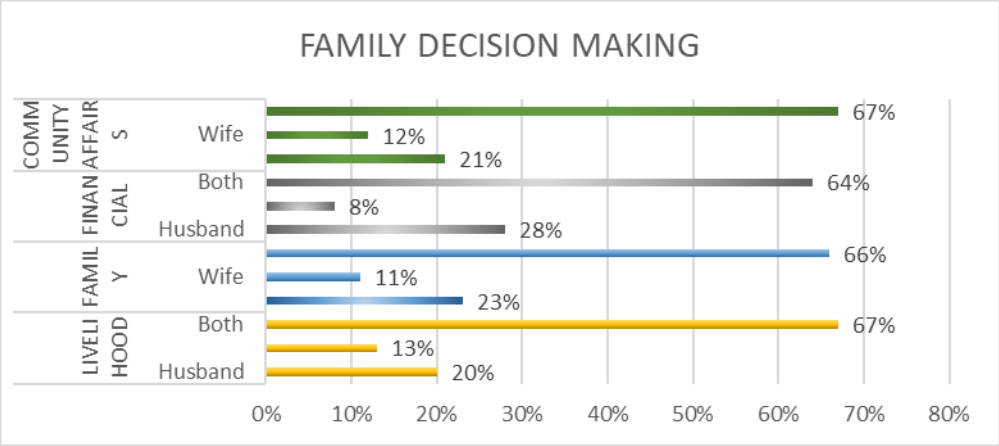


Figure 18: Decision Making

6.3.10. DISABILITY

With respect to the proposed Project, households with disabled members have been considered as potentially vulnerable to the changes induced by the Project; 93% had no members living with disability while 7 % had at least one member living with disability.

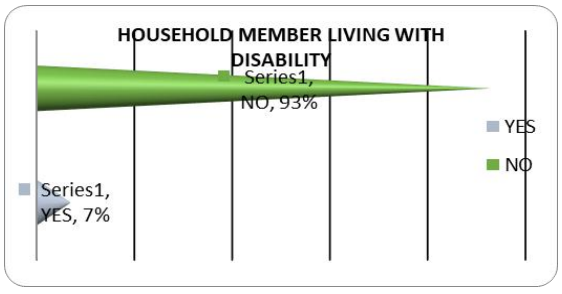


Figure 19: Person living with disability

The follow up question on the type of disability resulted in 72.73% Lame, 22.73% Mute and 4.55% Deaf. *This SIA has identified people living with disability as part of the vulnerable and marginalised groups. The team recommends extra assistance to be given to these vulnerable groups.*

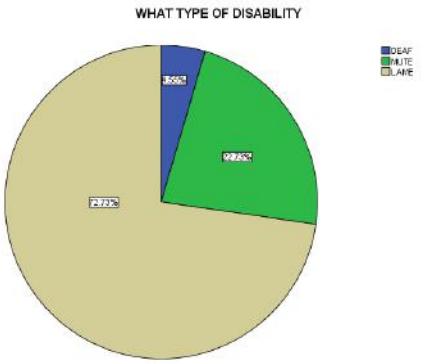


Figure 20: Type of disability

6.4. Household Assets

6.4.1.Means of Transport

Majority of the respondents do not own any means of transport (70%) only 30% had a means of transport.

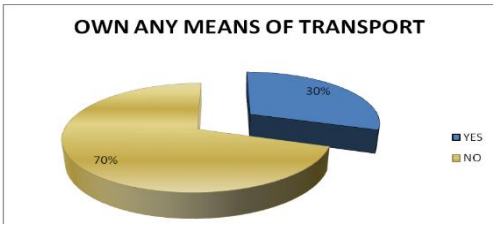


Figure 21: Own any means of transport

A follow up question on the type of transport owned resulted in 54.76% having cars, 26.19% having motorcycles the least was bicycle(3.17%)

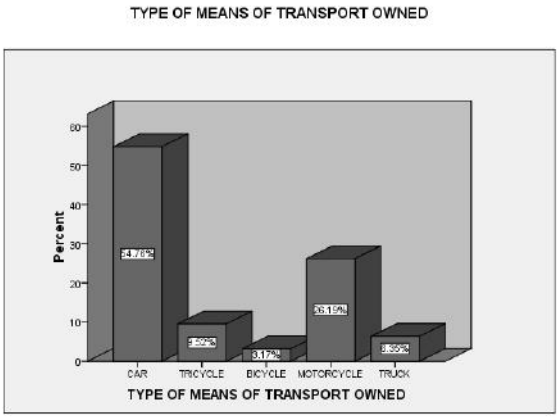


Figure 22: Type of means of transport owned

6.4.2.Type of Real property Owned

From the study, Majority of the respondent owned land (62%) followed by structure (28%) the least was land and structure (10%)

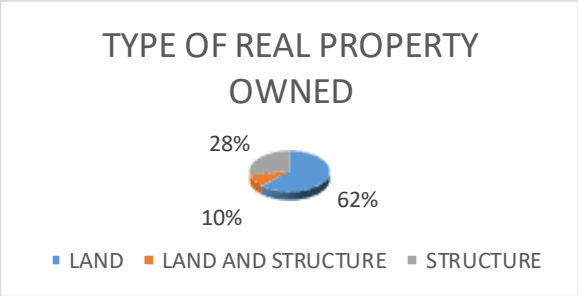


Figure 23: Type of real property owned

6.4.3.Location of Real property

90% of the real property was within the project area whereas only 10% was outside the project area.

Figure 24: Location of real property

6.4.4.Proof of ownership

A follow up question on the proof of ownership revealed that 91.37% had title deeds while 1.57% had deeds of sale.

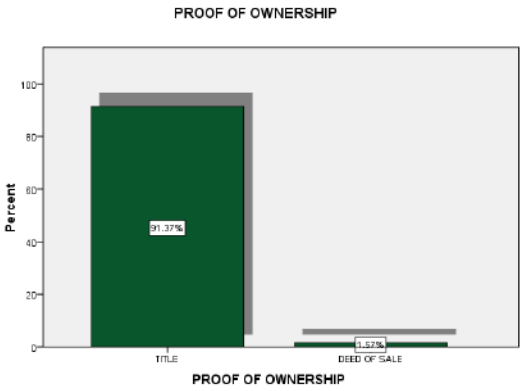


Figure 25:Proof of ownership

6.5. Income Levels

6.5.1. Total Monthly Household Income

Most Households in the project area have a monthly income of more than Kshs 30,000 (37.01%) followed by between 15001 to 20000 (11.27%) the least was below 1000 (0.5%). 2.45% of respondent indicated that they had no source of income, they mainly depend on other family members to support them

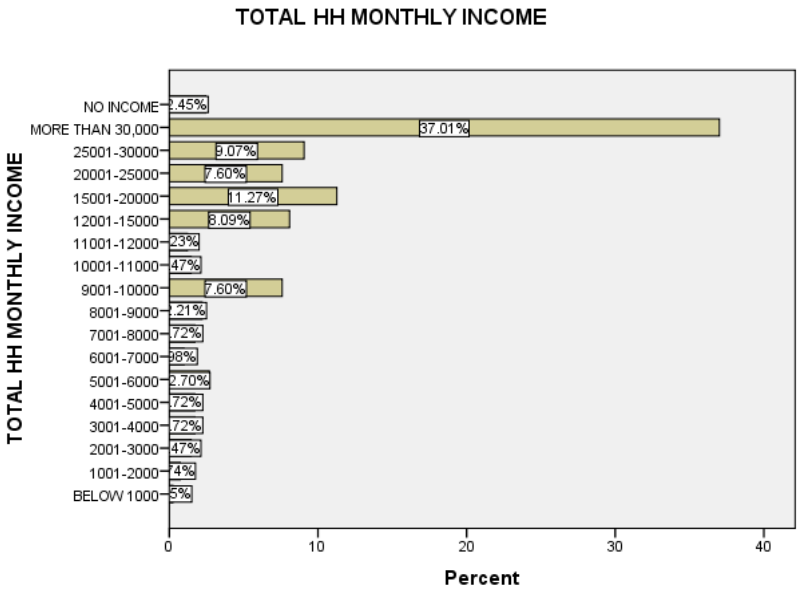


Figure 26:Total Monthly Income

6.5.2. Total Household Expense

Twenty-nine-point nine three percent of respondents spend more than 30,000, followed by between 12001-15000(13.47%), then 9001-10000(10.22%) the least was below 1000(0.75%). *Most of the respondents spend almost all the money they earn and are left with little to save.*

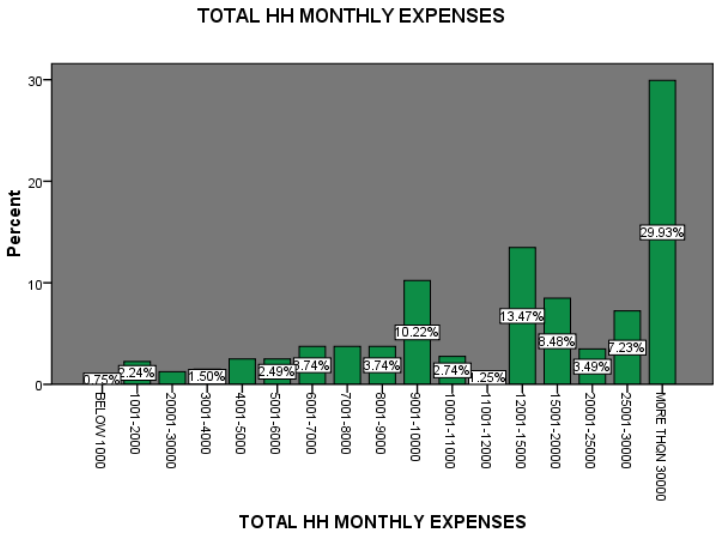


Figure 27:Total Monthly expense

7. IDENTIFICATION OF IMPACTS AND PROPOSED MITIGATIVE MEASURES

7.1. Introduction

The current Environmental and Social Impact Assessment follows the methodology set out by Environmental Management and Coordination Act, Cap 387 and EIA/EA Regulations; 2003; 2016 and assesses the environmental and social impacts during the construction and operation/ utilization of the proposed residential Project. This section presents both the potential positive (beneficial) and negative (adverse) environmental consequences of the proposed residential project construction. The framework methodology used in the current ESIA comprised of the following steps:

- Definition of the project and study area boundaries;
- Consulting with the public, interested organizations and other stakeholders;
- Data collection and baseline description;
- Identification and assessment of potential environmental and social impacts during construction and utilization phases; and
- Description of measures to mitigate potential significant adverse environmental/ social impacts and recognition of any residual effects after the application of these measures.

The potential project impacts were identified through field inspections, identification of alternatives, literature review, expert studies and stakeholders/ public consultation. A five-step process is used as indicated below:

i. Identification of feasible project alternatives that may limit impact on the environment;
ii. Identification of both environmental and social baseline parameters in project area;
iii. Identification and prediction of anticipated negative and positive impacts during the pre-construction, construction and operational phases;
iv. Evaluation of predicted impacts using Magnitude-Sensitivity Matrix; and
v. Development of an Environmental and Social Management Plan.

It was noted that most of the negative impacts associated with the project are of a temporary nature resulting during construction and can be minimised or mitigated by implementation of appropriate safeguards measures. It is also evident that the positive impacts accrued by the project are long-term in nature and go past the construction phase as the proposed project has the ability to spur economic growth as well as tourism in the project area among other benefits. The positive impacts therefore outweigh the residual negative impacts.

7.2. Impact Description

A potential impact is both a description of the planned project activities and their effects on the environmental or social receptors. Describing a potential impact involves an appraisal of its characteristics, together with the attributes of the receiving environment. Relevant impact characteristics include whether the impact is:

- Adverse or beneficial;
- Direct or indirect;
- Short, medium, or long-term in duration; and permanent or temporary;
- Affecting a local, regional or global scale; including trans-boundary; and

- Cumulative impacts; a cumulative impact is “the impact on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions”.

The relative intensity of the impact was assessed by the above characteristics. The sensitivity of the environmental and social receptors was then determined by the ESIA experts by ranking the components of the baseline data collected during the ESIA.

7.3. Impact severity for planned project activities

The purpose of impact assessment is to assign relative significance to the predicted impacts associated with the proposed project, and thus determine the order in which impacts are to be avoided, mitigated or compensated. By considering the combination of the magnitude of impact and the sensitivity of the receiving environment, the significance of the potential impact is derived. The determination of significance of an impact is largely subjective and primarily based on professional judgment. Key elements for assessing impact significance include:

- Level of public concern (particularly over health and safety);
- Scientific and professional judgment;
- Disturbance/ disruption of valued ecological systems;
- Degree of negative impact on social values and quality of life; and
- Public perception versus the scientific/professional opinion of the risks/benefits involved.

7.4. Impacts of unplanned events (or contingencies)

Unplanned events which have a potential to occur at the proposed road project were identified to include: vehicle accidents, insecurity or oil spillages, that are difficult to assess within the framework outlined above, because:

- Their intensity is difficult to quantify, since there is a wide range of possible events (i.e., the impact intensity is highly variable); and
- Unplanned events that may result in a severe environmental or social impact usually result in high financial, social and political liabilities and costs to the Government.

As best environmental practices, the project has substantially built-in controls to avoid such occurrences.

7.5. Assessment Methods and Significance.

This assessment has relied upon the experience of the ESIA team as well as existing standards and guidelines to describe the impact and significance of an environmental effect. Where appropriate, specific significance criteria based on International, National and Local/ County guidelines are defined and reported. The approach to assessing and assigning significance to an environmental effect or social impact relied upon the Magnitude-Sensitivity Matrix as shown in the table below. The expert judgments and reasoned argument; consideration of any relevant County and National Legislation, Regulations, Standards or Codes of Practice as well as the advice and views of relevant Governmental organizations were all taken into account in the prediction of the impacts.

The proposed project activities and their impact severity was determined by evaluating the intensity of the impact and the sensitivity of the environmental and social receptors, which was largely subjective but based on the professional judgements of the entire team of specialists. This methodology required assigning of numerical descriptors to the impact intensity, as well as the environmental and social receptors, for each potential impact. The numerical descriptors are 1, 2, 3, or 4; which are equivalent to very low, low, medium or high. The impact severity was then calculated as the product of the two numerical descriptors, which was equivalent to negligible, minor, moderate or major, as indicated in the Table 5. This approach is a semi-qualitative method designed to provide a broad ranking of the different potential impacts envisaged to result from proposed residential project construction activities.

Table 10: Magnitude Intensity-Sensitivity receptor Matrix

MAGNITUDE - SENSITIVITY MATRIX			SENSITIVITY OF RECEPTOR			
			Very low	Low	Medium	High
			1	2	3	4
INTENSITY OF IMPACT	Very Low	1	1 Negligible	2 Minor	3 Minor	4 Minor
	Low	2	2 Minor	4 Minor	6 Moderate	8 Moderate
	Medium	3	3 Minor	6 Moderate	9 Moderate	12 High
	High	4	4 Minor	8 Moderate	12 High	16 High

7.6. Mitigation and residual significance

All moderate to major adverse impacts are considered for mitigation. Specific measures were suggested in this regard where practicable. With regards to negligible and minor impacts where the project activity is not expected to cause any significant impact in such cases, best practice measures were recommended where appropriate to improve the environmental and social performance of the proposed project. The potential impacts are assessed for severity and mitigation measures are designed to reduce this impact severity. The mitigation options considered may include project design modification, provision of alternatives and project timing. In cases where the effectiveness of the mitigation is uncertain, monitoring programs shall be introduced. The impact severity is then re-assessed, assuming application of the mitigation measures, to derive the 'residual' impact severity

7.7. Positive Impacts

Broadly, the identified positive impacts associated with the proposed project include:

7.7.1. Increased national housing stock

There is currently a high demand for housing in Kiambu and Nairobi and other cities and towns in Kenya. It has also been projected that 60% of the world population will live in cities by 2050. The growing urban population calls for affordable housing. The proposed project is geared towards filling the existing housing stock gap by availing more residential units. This will add to the supply of housing which is currently a major socio-economic problem for Kenya and especially in Kiambu and Nairobi

7.7.2.Employment Opportunities

The construction of the proposed project will create employment opportunities for both skilled and unskilled personnel. Skilled personnel will be employed as Managers, Supervisors, Engineers, Architects, Surveyors, Health and Safety, and in other technical positions whereas semi-skilled and unskilled labourers will be employed as support staff and perform non-technical and administrative tasks. The community members in the project areas are highly expectant of employment opportunities that are likely to arise from the project activities. From all the public meetings conducted during the assessment, the community members mentioned that the contractor should consider offering jobs to the locals first before sourcing man-power from outside the project area. They also stated that the jobs should be distributed fairly.

The impact magnitude will be high considering there will be job opportunities for the locals.

7.7.3.Gains in the County and National Economy

Expected gains in the local and national economy from the construction and utilization of the proposed residential project will be in the form of consumption of locally available materials including: fine and course aggregates, timber, cement, glass, metal, and among other construction materials; taxes levied from contractors and employees; and income from business associated with the project will also boost the local economy.

7.7.4.Informal Sector Benefits

There are usually several informal businesses, which come up during the construction periods of such projects. These include food vendors who benefit directly from the construction workers buying food and other commodities from them. This will promote the informal sector in securing some temporary revenue and hence improve their livelihood.

7.8. Visual and landscape impacts

7.8.1.Construction phase impacts

Site clearance, earthworks and construction of the housing project will lead to loss of vegetation, mainly grass cover at the site, disturbance and potential loss of topsoil during excavation works. Deposition or dumping of construction waste or unsightly stockpiles of any material on the premises are also likely to cause an eyesore, loss of serenity and aesthetic value.

The construction site will be visible to a large number of people due to its elevation and proximity to road, and the visual intrusion caused by the site and activities may be of some adverse impacts to humans in the project area.

Some measures can however be applied to reduce the visual nuisance and adverse impacts on the landscape caused by construction activities:

- *Construction works should be carried out in such a manner that will not hinder drainage, or introduce physical changes that are not in harmony with the physical setting of the Project area. The structures to be developed should be aesthetically acceptable to blend in with the surrounding;*

- *The Proponent should as much as possible complete the works in such a way that natural aesthetics are retained at the site. Re-vegetation should be undertaken to restore the disturbed grounds; and*
- *Landscaping activities should include planting of indigenous trees and shrubs around the houses, and other open areas*

The impact magnitude will be low since the sensitive receptors are the residential homes neighboring the site. Therefore, the visual change during construction phase will be assessed as minor

7.8.2. Operation phase impacts

The high-rise buildings will be a permanent feature visible from afar, and the visual appeal of the neighborhood is likely to be lowered by these and other development projects in the area. Project designs include external finishes that enhance the visual appeal of the buildings. Ornamental vegetation will also be planted and maintained in open areas to compensate for the loss during construction.

7.9. Impacts on ambient noise and vibrations levels

Considering that the project site is next road, the baseline ambient noise levels are relatively high due to road noise and other vehicular noise. Activities at the site during construction and occupation may contribute to the noise levels and impacts in the project area.

The significance of noise impacts depends on whether the Project will increase noise levels above the existing ambient levels by introducing new sources of noise. Noise impacts are considered significant if the Project results in:

- *Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;*
- *Exposure of persons to, or generation of, excessive ground-borne vibration or ground-borne noise levels;*
- *A substantial permanent increase in ambient noise levels (more than 3 dB) in the project vicinity above levels existing before the project; and*
- *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing before the project.*

7.9.1. Construction phase impacts

Construction works – excavations, delivery of materials, carting away of spoil and the use of machinery/equipment will contribute to elevated levels of noise and vibrations within the construction site and the immediate surroundings. The increase in traffic movements along the access road may cause a noticeable increase in daytime noise levels through the settled area. The higher noise and vibrations levels may be of some nuisance to the immediate neighboring public to the construction site.

The noise impact will be localized and temporary, and will, for the most part, be restricted to the construction phase of the project. In addition, due to the nature of the construction process, noise levels will fluctuate in line with operating periods and the combination of machinery being used at any one time.

The impact significance during construction will be moderate due to the fact that the impact magnitude is low and the receptor sensitivity is medium. The proposed site is on very close proximity to few residential homes.

7.10. Noise management

The following noise-suppression techniques should be employed to minimize the impact of temporary construction noise at the project site.

- *Portable hoods should be installed to shield compressors and other small stationary equipment where necessary;*
- *Pumps, generators and other mobile equipment should be sited as far as practicable from noise sensitive locations;*
- *The contractor should endeavor to use equipment installed with noise abatement devices as much as practicable;*
- *Idling time on trucks and other noisy equipment should be limited to a minimum. Drivers should be encouraged to turn off vehicle engines when not in use, avoid unnecessary hooting or revving of engines;*
- *Personal protective equipment such as noise-cancelling earmuffs should be provided to workers at the site as necessary; and*
- *Construction work should be carried out during the day only. No works should be carried out on Sunday. Noise monitoring is also proposed especially at noise-sensitive receptor locations (such as homesteads) proximal to the construction site and the access road.*

7.10.1. Operation phase impacts

Noise and vibrations are not expected to increase considerably during project operation. The expected noise will be mainly from humans residing in a cluster of houses, and the significance of the noise impact during operations is deemed to be Minor.

7.11. Impacts on local air quality

7.11.1. Construction phase impacts

Construction activities are likely to generate air pollutants which have potential to adversely affect the local air quality, and thereby affect human and vegetation health. The activities include:

7.12. Dust generation

Construction activities such as site clearance and grading, excavations/ earthworks, stockpiling of materials and spoils, and vehicular movements in the project area will generate dust and increase the levels of particulate matter (PM) in the atmosphere. Dust and sand particles are also likely to be blown from the upper floors of the buildings onto surrounding premises as construction progresses above the ground level.

Once airborne, dust will generally travel downwind before resettling. The distance travelled depends primarily on wind speed and particle size. For example, smaller particles and strong winds result in greater dilution effects but mean that the dust is deposited over a larger area.

7.13. Exhaust emissions

Construction vehicles and machinery are likely to emit oxides of carbon, nitrogen, and sulphur, and depending on the level of maintenance performed on the vehicles and machinery, the emissions may be significant, causing a deterioration of the local air quality.

7.14. Burning of waste

Disposal of waste (vegetation and other combustible materials) by burning will also cause local air pollution in the emission of gases and particulate matter. There is the additional risk of spread of fire to unintended areas with potential to cause damage/destruction of property and vegetation. The potential impacts are nuisance and adverse health effects such as respiratory problems on workers and people in the surrounding area, coverage of crops (possibly leading to reduced yields) and deposition on natural vegetation especially during the dry season.

7.15. Air quality management

The neighbours of the proposed project site were noted to be mainly residential in nature. The distances from a source that dust impacts can occur is highly site specific and will depend on the extent and nature of incorporated mitigation measures and prevailing wind conditions. Due to the variability of the weather, it is impossible to predict what the weather conditions will be when specific construction activities are being undertaken. Therefore, the assessment of construction dust impacts is typically qualitative. The impact magnitude will be moderate. In order to control point source and fugitive emissions that may occur during construction of the project, the following measures should be implemented:

- *Installation and maintenance of dust screens on the buildings as construction progresses above the ground level;*
- *Maintenance of equipment and machinery to manufacturers' specifications by regular servicing to maintain efficiency in combustion and reduce carbon emissions;*
- *Use environmentally friendly fuels such as low sulphur diesel;*
- *Minimize idling of machinery;*
- *Ensure no burning of waste at the site and non-designated areas;*
- *Regular sprinkling of disturbed ground and dusty access roads;*
- *Control of construction vehicle speeds by imposition and enforcement of speed limits especially along access roads;*
- *Rehabilitation of disturbed areas once completed;*
- *Use of tarpaulins to cover trucks carting away spoil using public roads. Additionally, the trucks should maintain at least two feet of freeboard;*
- *Proper planning of transportation of spoil to ensure that the number of trips and/or the number of vehicles used is minimized; and*
- *Provision of appropriate Personnel Protective Equipment (PPE) such as dust masks to site workers.*

7.15.1. Operation phase impacts

Occupation of the houses is unlikely to have any significant impact on the local air quality. Depending on the finish level of the access road, dust may be generated by vehicle movements along the road. Additionally, if the maintenance level on the development's sewage collection and disposal system is poor, there may also be nuisance from foul odor.

The access Road will be cabro. Maintenance schedules will also be developed and implemented for the project's sewer system.

The impacts are thus expected to be Negligible or Minor.

7.16. Impacts on water resources

7.16.1. Construction phase impacts

7.16.1.1 Increased demand for water

During the construction phase of the proposed Project, both the construction workers and the construction works will increase the demand for potable water. The water will be required in mortar and concrete works, for drinking and cleaning purposes, and for dampening of dusty areas. The water demand is expected to be met from the Getathuru River and/or water vendors. Since the existing demand on local ground and surface water resources in the area is relatively low, water use conflicts with the surrounding community are unlikely, and the effects of the increased demand are perceived to be Minor

7.16.1.2 Degradation of water quality

7.16.1.2.1 Spillage of contaminants

Various risks to water quality could arise from sources of pollution during construction including spillage of fuels, lubricants and other toxic materials at the construction site, discharge of silt laden runoff from the site, and the inadequate treatment and disposal of waste and wastewater from the site.

Materials such as oil, diesel fuel, concrete additives, and solvents are likely to be stored and used at the construction site and in construction vehicles and equipment. Storage and handling of these materials could lead to spills or leakages which could pollute the underlying soil, and ground water resources. Contaminated runoff from the site could enter into local stormwater drainage systems and eventually into receiving watercourses which in the project area is Getathuru River.

The extent of impact would depend on the size, frequency and timing of spills in relation to flow conditions in the receiving waters and the nature of the materials involved including their toxicity and likelihood for biomagnification or bio-accumulation.

Since the development is within proximity of the Getathuru River, the proponent is advised to:

- *The risk of water pollution from these sources can be reduced by adopting protective measures to prevent spills and establishing suitable spill response plans to be implemented in the event of accidents occurring.*
- *Suitable measures to collect, treat and dispose of chemical wastes will also be required*.
- *Protect the riparian by ensuring that no works interfere with the river to a minimum of 6 meters and a maximum of 30 meter on either side based on the highest recorded flood levels pursuant to regulation 6c of the water quality regulations 2006.*
- *Observe, protect and conserve the riparian reserve in compliance with the water Act 2016 and water reserve management rules 118(1)*
- *The risk of water pollution from these sources can be reduced by adopting protective measures to prevent spills and establishing suitable spill response plans to be implemented in the event of accidents occurring.*

Suitable measures to collect, treat and dispose of chemical wastes will also be required. With good construction site practices, the risk of water pollution from spills and waste could be downgraded to Minor

7.16.1.2.2 Direct discharge of waste into the environment

Construction activities will generate liquid wastes such as concrete wash water and/or other wastewater which if not appropriately managed, could result in direct flows into the neighboring stream where it would have negative effects on local water quality (including reduction in dissolved oxygen levels, nutrient loading causing increased algal growth, and the spread of pathogenic disease vectors) and cause the loss of aquatic organisms.

With adequate provision for on-site waste and wastewater management during construction, the extent of impact is judged as Moderate, and will depend on the location of discharge points and the dilution potential of receiving waters.

7.16.1.3 Management of construction phase impacts

- *The Contractor should ensure that water is used efficiently at the site by sensitizing construction staff to avoid extravagant water use and wastage. He should also monitor water consumption and maintain records;*
- *Wherever possible, harvest storm water to complement other sources of water;*
- *Recycle and reuse construction wastewater wherever possible and where this does not compromise the quality of construction works;*
- *Develop and implement a site construction waste and wastewater management plan to minimize environmental damage from construction activities. This should include the delivery of regularly updated training to construction workers in the safe and proper storage, handling, use, clean- up, and disposal of oils, fuels and other chemicals and the putting in place of a comprehensive spill response plan including equipment and training;*
- *Install secondary containment measures in areas where fuels, oils, lubricants etc. are stored and loaded or unloaded, including filling points;*
- *Construct a concrete washout pit to contain wash water and enable consolidation of solids for easier disposal. The consolidated solids can then be recycled or used as fill material;*
- *Implement soil erosion control measures and install and regularly empty sediment traps in surface drains around construction areas;*
- *Minimize soil disturbance and excavation during wet season;*

7.16.2. Operation phase impacts

Occupation of the residential houses will lead to increased water demand for consumption, cleaning, and flushing of toilets. The main source of water for the proposed development will be an on-site borehole. Over abstraction of ground water from the well could lead to a lowering of the water table and affect the yield in other neighboring wells. The impact is perceived to be Moderate if water resource conservation measures are implemented in the development.

The development will generate significant volumes of sewage which will be disposed through a septic tank with a soak pit at the site. Wastewater discharged into the soak pit could contaminate neighboring shallow wells if biological treatment of the waste within the tank is inadequate. With implementation of groundwater protection measures, the significance of the impact will be Moderate.

7.16.2.1 Water resource management

- *Institute measures to ensure conservative use of water in the development such as:*
- *Monitoring of water resource use at the premises through water meters installed in the houses;*
- *Rain water harvesting from roof catchments for indoor and outdoor water requirements; and*
- *Installation of low volume fixtures and fittings such as taps, and cisterns in the houses*

Implement measures to prevent contamination of ground water by:

- Ensuring that the septic tank is adequately sized to increase detention time of the wastewater and allow biodegradation of the waste

  - *If necessary, supplementing the microbial community in the septic tank with available septic tank treatment products to reactivate and maintain the system*
  - *Installing Fats Oils and Grease (FOG) traps on the waste water collection system to remove FOG that could reduce the efficiency and effectiveness of the microbes in the septic tank and*
  - *Periodic water analysis done to the nearest water body to find out whether there is contamination.*

7.17. Impacts on soil resources

7.17.1. Construction phase impacts

Project construction will involve earthworks and excavation specially to achieve the desired levels for the apartment blocks, underground water storage facilities, and profile for the driveway. This will result in the generation of spoil materials requiring disposal. Offsite disposal of the soil will lead to loss of the fertile topsoil and depletion of local soil resources.

Construction activities at the site may lead to soil sealing especially when heavy construction machinery and trucks compact the surface soil. Soil compaction and sealing may lead to increased surface runoff and soil erosion from the site.

Any spillage of hazardous materials on site is likely to cause soil contamination and/or eventual Surface /groundwater contamination. The hazardous materials include oils, fuel, grease, paints, solvents, curing compounds, adhesives, acids, soil stabilizers and binders etc. These materials require careful handling and storage to prevent spillage.

Vehicle, plant and machinery maintenance on site can also lead to soil pollution in the event of spillage of hydrocarbons (such as oil and fuel).

The significance of the impact to the soil will be minor due to the nature of the works and the fact that construction and operational activities will be confined in the project site.

7.17.1.1 Soil resources management

To prevent soil erosion, re-vegetation of disturbed areas should be done as soon as possible. Vehicles should use predetermined tracks at the site to reduce ground compaction;

Vehicle and equipment maintenance activities should be done as much as possible away from the site while a designated area away from drainage courses should be identified to carry out necessary repair or maintenance activities. Drip pans and absorbent materials should be availed at these designated areas to manage spillages;

The Contractor should review spill response requirements at all applicable work sites and train workers on spill prevention and clean-up. Clean-up requirements should include: Immediate clean-up of leaks and spills; use of absorbent materials for large spills; avoidance of hosing down or burying dry material spills; and proper disposal of materials used to clean up hazardous materials

7.17.2. Operation phase impacts

Once the project is in operation, impacts on soil resources are likely to occur if stormwater management plans are inadequate such that stormwater discharge from the premises causes soil erosion on neighboring low-lying areas. Project designs however include a site stormwater drainage system which will connect to the biodigester. *The risk of soil erosion will thus be Negligible.*

7.18. Impacts on local biodiversity

The proposed site was an agricultural land. Natural vegetation has been heavily modified by human activities. The few trees and shrubbery found next to the plot are utilized by various passerine birds' species as nesting and foraging sites, while rodents may also inhabit suitable surface and subsurface environments at the site.

7.18.1. Construction phase impacts

Construction works will disturb the birds that uses the neighboring vegetation and river as forage grounds, and habitat for rodents.
The vegetation cover is however minimal and its removal is unlikely to have any significant impacts on local biodiversity. The birds and rodents will move on to other suitable sites in the neighborhood. *The impact on biodiversity is therefore likely to be negligible or minor.*

7.18.1.1 Management of biodiversity

Clearance of part of the vegetation at the site will be inevitable. However, some remedial measures that can be implemented include:

- *Re-vegetation of open areas;*
- *Prioritization of the planting of indigenous trees and shrubs -, although various species of exotic trees and shrubs could also be planted*

7.18.2. Operation phase impacts

Occupation of the houses is unlikely to have any additional adverse impacts on local biodiversity. Maintenance of planted ornamental vegetation on open areas may however attract some birds' species.

A majority of people who will be affected by the project, the project proponents and contractor need to ensure the right people are identified and engaged during the implementation process of the proposed residential project.

7.19. Impacts on energy resources

7.19.1. Construction phase impacts

Fossil fuels (mainly diesel) will be used in the running of vehicles and other motors at the construction site. Fossil energy is non-renewable, and its use emits greenhouse gases and other air pollutants.

Construction activities for the project will not require significant volumes of fossil fuels. At the local scale, depletion of the resource is of little significance and is best analyzed/quantified at a national/global scale.

7.19.1.1 Energy resource management

Despite the low impact on energy resources, it is prudent to institute measures to conserve fossil fuel since these also impact on local air and noise pollution levels. Proposed measures include:

- *Minimize idling of machinery;*
- *Avoid overloading of trucks and machinery; and*
- *Regularly service vehicles, plant and machinery*.

7.19.2. Operation phase impacts

Occupation of the houses will lead to an increase in the grid energy demand. This will be due to the wide array of household electronics that are likely to be in use, with the concomitant higher demand for electricity to power these electronics. The area is served by grid energy infrastructure, and the electricity distributor – Kenya Power continually upgrades the infrastructure (transformers, poles and conductors) as the demand grows. Project designs also include technologies to utilize solar energy for lighting, pumping of water and water heating. Other energy conservation measures incorporated in designs include properly sized windows to allow maximum natural light entry. The size of windows also factors the need to maintain a warm internal environment. Energy use will also be monitored during the project lifetime through installation and reading of energy consumption meters.

The impact of the increase in demand is therefore likely to be Negligible or Minor.

7.20. Waste management

7.20.1. Construction phase impacts

Construction activities will generate inert, non-hazardous and hazardous wastes over the construction period. Wastes likely to be generated during construction include spoils (rubble and soil from excavations), vegetation (felled trees, shrubs, stumps and their root systems) packaging materials used for packing cement, plastics, reject materials including damaged bricks/blocks, and leftovers/excesses, wastewater (concrete washout), and equipment maintenance waste. An active construction site also requires proper sanitation facilities to manage sewage generated by construction workers.

Improper waste management at the construction site will interfere with the aesthetic status of the surrounding while creating health and safety hazards. Improper disposal of the wastes off-site could also cause nuisance, health and safety hazards, and create breeding grounds for vermin.

Failure to use these methods for waste management can cause nuisance, environmental pollution, and create health hazards, and the significance of the potential impacts is perceived to be Major.

7.20.1.1 Construction phase waste management

The following measures are proposed to manage wastes generated at the site:

- *Contractor should apply caution in demolition activities in order to salvage fixtures and building components as much as possible for reuse elsewhere;*
- *Construction waste should be recycled or reused as much as possible to ensure that materials that would otherwise be disposed off as waste are diverted for productive uses. In this regard, the Contractor should ensure that construction materials left over at the end of construction are used in other projects rather than their disposal*
- *Land-fill spoils as much as possible at identified fill areas;*
- *Felled trees, shrubs and stumps can be isolated for collection by locals as firewood;*
- *Provide a pit latrine at the site for use by workers. The pit latrine should be backfilled upon project completion;*
- *Vehicle maintenance should as much as possible be done off-site (at a commercial garage) and wastes (used oil, oily rags, cans and used parts) disposed in a designated area. Where maintenance must be carried out on site, wastes generated should be carted away from site for disposal in a designated area; and*
- *The Contractor should put in place measures to ensure that construction material requirements are carefully budgeted and to ensure that the amount of construction materials left on site after construction is kept minimal*.

Additional measures for minimization of solid waste during construction of the proposed Project could include the use of durable, long-lasting materials that will not need to be replaced often, thereby reducing the amount of construction waste generated over the project lifetime.

7.20.1.1.1. Concrete waste management

Concrete will be used in establishment of foundations, slabs, columns and other elements of the buildings. Equipment and tools that are in contact with concrete and mortar need to be washed after use, and this generates significant volumes of wash water. The following measures are proposed for concrete waste management at the premises:

- *The Contractor should avoid mixing of excess concrete if possible, and should discard excess concrete in a designated area away from water courses;*
- *Washing of concrete coated vehicles or equipment should be done off-site or in a designated wash area a minimum of 50 feet away from drainage channels. The runoff from the on-site concrete wash area should be contained in a temporary pit where the concrete can set; and*
- *The temporary pit should be lined with plastic or clay to prevent seepage of the wash water into the ground. The wash water should be allowed to evaporate or collected along with all concrete debris in a concrete washout system bin.*

7.20.2. Operation phase impacts

The residential houses are expected to generate significant amounts of organic/inorganic solid and effluent wastes. Project designs include a designated area for the collection and temporary

storage of solid waste generated by the households, and a septic tank with a soak pit for the collection and disposal of sewage from the development.

The quantity of hazardous and non-hazardous waste generated during the operational phase will be much lesser quantity than during the construction phase. Thus, the receptor sensitivity Impact magnitude has been assessed too small

7.20.2.1 Waste management

- *The Proponent should procure services of a certified waste management company to ensure appropriate disposal of the generated solid wastes. Wastes generated should be collected and held at the designated temporary storage area near the main gate awaiting collection by the certified waste handler at regular intervals.*
- *The Proponent should ensure the regular inspection and maintenance of all drainage networks at the premises to prevent malfunction.*
- *Grease traps should also be installed to remove fats, oil and grease in grey water from kitchens and prevent it from entering the sewer system*

7.21. Traffic impacts

7.21.1. Construction phase impacts

Inevitably, the site access road (Getathuru Road) and Ngecha Road will encounter increased traffic due to presence of construction vehicles. These vehicles will include both heavy and light vehicles and equipment travelling in and out of site.

Likely impacts of increased construction traffic include; nuisance from obstruction and slow movement of construction vehicles; and increased safety hazards for other motorists and pedestrians.

In order to reduce adverse impacts of increased vehicular traffic at/around the construction site, the following measures are proposed:

- *Develop and implement a Traffic Management Plan (TMP) and principles to ensure safety, prevention of traffic snarl ups and congestion.*
- *The TMP should minimize the points of conflict between construction traffic and existing traffic to limit the possibility of traffic accidents and disruptions to road users. It should also reduce the number of deliveries where practicable, including staging of deliveries such that the volume of traffic is kept as even as possible avoiding peaks, and control vehicular movements on the project.*

Other elements of the TMP should include:

- Planning and managing both vehicles and pedestrian routes;
- The elimination of reversing where possible;
- Safe driving and working practices;
- Protection of the public;
- Adequate vision and lines of sight;
- The provision of signs and barriers; and
- Adequate parking and offloading/storage areas

The significance of the impact during the construction phase is weighed to be of moderate

7.21.2. Operation phase impacts

Occupation of the proposed houses is expected to cause a permanent increase in vehicular traffic on the Getathuru road, with the resultant increase in nuisance and safety hazards. In a worst-case scenario, there would be a traffic increase by about 150 vehicles, assuming one car per household. However, the development targets the lower middle-income households – some of whom may not own cars. The actual number of vehicles attributable to the development may thus be significantly lower, and the potential adverse impacts are perceived to be Moderate. The critical times of increased traffic and congestion may be in the morning and evenings when the populace is headed out or returning home.

Traffic Management

To minimize disruption of traffic flow along the site access road, the main entrance to the development should be recessed and widened to allow waiting for a vehicle before entry/exit from the property

Clear signage should also be installed and maintained to warn drivers on the maximum vehicle speed limit, and other hazards.

7.22. Impacts on health and safety

7.22.1. Construction phase impacts

7.22.1.1 Occupational health and safety

Safety hazards are likely to increase during demolition and construction activities resulting in a possible increase in accidents involving workers and/or the general public. The construction works inevitably expose workers to occupational health and safety risks and injuries resulting from accidental falls, or use of hand tools and construction equipment. Safety hazards are also posed to the public especially pedestrians and motorists passing near the site. Whereas some incidences/accidents can be minor resulting in minor bruises/injuries, others can be serious to fatal resulting in both losses of life and destruction of property. Adequate sanitary facilities (toilets, potable water) are also required at the construction site to prevent the occurrence of hygiene related ailments among construction staff and the general public.

The significance of the impact during the construction phase is weighed to be of moderate. All the construction activities will be limited at the project site thus the magnitude will be low.

7.22.1.2 Community health, safety and security

Poor construction management practices by the Contractor have potential to cause direct adverse effects on the safety, human health and wellbeing of the surrounding community. Such include inadequate management of air emissions, wastes generated, traffic and other safety hazards posed by construction sites or construction activities, and the poor management of his labor force.

Any incident that harms a person has potential to diminish the quality of life for that person, negatively impacting them or their household livelihood, and potentially creating tension between the local community and project teams.

The overall significance of the impact is judged to be Moderate but this may reduce depending on mitigation and management measures in place, the severity of any accidents and availability of emergency health care to deal with such accidents.

7.22.1.3 Occupational health and safety management

The following measures are proposed to enhance occupational health and safety at the construction site:

- *To reduce accidents and hazards involving/ posed to workers, the Proponent should commit the Contractor to adherence to site occupational health and safety rules and regulations as stipulated in the Occupational Safety and Health Act, 2007;*
- *The Contractor should provide all workers on site with the necessary Personal Protective Equipment (PPE), and ensure a safe and healthy environment for the construction workers;*
- *Worker's accidents during construction should be mitigated by enforcing adherence to safety procedures and preparing contingency plans for accident response. In addition, safety education and training should be emphasized;*
- *The Proponent should require the Contractor to have qualified first aider(s) among the workers and maintain fully stocked first aid equipment at the site; and*
- *The Contractor should avail to the worker's adequate sanitary facilities such as toilets and potable water to maintain high health standards at the construction site*

7.22.1.4 Community health and safety management

The following measures are proposed to enhance community health and safety during construction work for the project:

- *Implementation of specific management plans on housekeeping, waste, air quality, traffic, health and safety and pollution prevention;*
- *Informing local communities of major activities in advance;*
- *Development and implementation of a community grievance redress mechanism;*
- *Ensuring that the construction site is fenced off to prevent unauthorized access;*
- *Following best practice to prevent the creation of breeding areas for vermin;*
- *Spraying construction areas and local roads regularly with water to suppress dust emissions;*
- *Ensuring that potentially disturbing construction noise is not produced outside of working hours;*
- *Safety training, traffic management and a high prioritization of public safety by the Contractor*
- *Developing and enforcing a strict code of conduct for workers to regulate behavior in the local communities;*
- *Providing awareness training to the workforce regarding the transmission of STDs, and traffic safety awareness;*
- *Provision of adequate sanitation; and*
- *Provision of the workforce with access to healthcare.*

7.22.2. Operation phase impacts

Potential sources of hazards that can result in adverse impacts during occupation of the houses include stairways, open terraces on top of buildings, electricity and electrical appliances, cook stoves in the houses, etc. Stairways and roof terraces present the danger of trip and falls, while use of electrical appliances and cook stoves presents fire risks. Project designs include

provisions for adequately sized and lit stairways with hand rails, parapet walls with railing on the rooftops, and cabinets for firefighting equipment on each floor. These provisions will minimize the occurrence of accidents or mitigate the escalation of incidents such as fire within the households.

7.23. Impacts on other natural resources

7.23.1. Construction phase impacts

Some of the construction materials that will be used include masonry stones, hardcore, ballast, quarry dust, sand, and cement. These raw materials will be obtained from stone quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers and land. Unsustainable extraction of these resources can cause environmental damage where they are sourced.

7.23.1.1 Raw materials management

- *The Contractor should source construction materials such as sand ballast, quarry stones, and hard core from registered and approved quarries and sand mining firms whose projects have undergone satisfactory environmental impact assessment/audit and received NEMA approval. Since such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated;*
- *The Contractor should implement stringent inventory management mechanisms and only order for materials after a fairly accurate estimation of actual construction requirements;*
- *Where possible, building elements should be manufactured off-site and delivered to site, to maximize benefits of off-site manufacture including minimizing waste, maximizing recycling (because manufacture is in one location), high quality elements, better occupational health and safety management, less noise and dust*

7.23.2. Operation phase impacts

Apart from impacts of groundwater exploitation and pollution of the nearest Getathuru river, no other impacts on natural resources are foreseen when the houses are occupied.

7.24. Cumulative impacts

It is important to consider the cumulative effects of placing the development in the particular environment proposed. This assessment considers the cumulative effects that are likely to result from the project in combination with other projects or activities that have been, or will be carried out in the foreseeable future.

Anticipated cumulative effects of the proposed development and other developments in the neighborhood include:

7.24.1. Impacts on the microclimate of the area

An increase in the development density of the neighborhood while eliminating vegetation cover will lead to a change in the microclimate of the area. This may be experienced in form of warmer local temperatures, and higher wind speeds.

To mitigate the above effects, property owners and local authorities could collaborate to ensure that developments maintain a specific level of vegetation cover as a minimum - preferably of trees planted in green spaces and Tree Boxes/Planter Boxes.

7.24.2. Impacts on the surface and ground water regimes

A higher development density in the neighborhood will lead to an increase in paved surfaces, reduced infiltration of storm water, and higher dependance on groundwater for consumption. This will negatively affect ground water recharge and water table levels in the area. The increase in paved surfaces in the general area will lead to an increase in surface runoff generated during rain episodes. Inadequate construction and maintenance of storm water drainage systems in the area my lead to increased incidences of erosion and local flooding.

The above impacts can be mitigated to a certain degree through harvesting and utilization of storm water, and restricting the ground coverage of developments to allow for green spaces within properties. Developments could then be encouraged to incorporate rain gardens and bio-retention areas, vegetated swales and buffers, and permeable pavements to encourage storm water infiltration. Other drainage infrastructure could include infiltration trenches, drywells, seepage pits, and improved sinkholes.

7.24.3. Impacts on traffic

An increase in residential and commercial development density in the neighborhood is likely to increase vehicular and pedestrian traffic in the general area potentially resulting in traffic delays and queues, and increase in accidents involving motor vehicles and pedestrians.

Mitigation of the above impacts will require involvement of the roads' authorities/local government in installation and maintenance of road signage, expansion and maintenance of roads and walkways,

7.24.4. Site Security

An influx of outsiders into any community is likely to bring conflict if either party is not respectful of each other. There will therefore be need to develop and foster peaceful co-existence:

- *Proponent to ensure the public are involved in all stages and that their recommendations and concerns are addressed so as to encourage ownership of the project;*
- *Proper site fencing and security must be in place to safeguard site property and safety and control movements;*
- *Engage manned security to record and process entry into the construction site.*

7.24.5. Loss of cultural ties

In the project site, there was a *Mugumo* tree. Ancient Kikuyu tradition holds this tree as a sacred tree, because it was thought that spirits, especially deceased ancestors, dwelt in this tree. The tree should not be cut under any circumstances. The tree was cut but before it was, the elders were notified and a ceremony was held at the place.

Proposed Mitigation Measures

- *The sociologist to consult with the Agikuyu council of elders on traditions to be followed even after the Mugumo tree is cut to pave way for the construction.*
- *Public participation and transparency to be encouraged throughout the project's cycle*

Based on the ceremony done before the *Mugumo* tree was cut, there was no other cultural heritage at the project site. Therefore, the impacts on cultural heritage during the construction phase will be Minor considering low sensitivity of the receptor and low magnitude of the impact

7.24.6. Vulnerable Households

Vulnerable household members are those who given their predisposition in society may have a hard time adopting to project induced challenges. In this project the vulnerable categories include; Persons living with disability, elderly, young mothers and widows/ers.

From the study Persons aged 60 and above are considered as vulnerable, they accounted for 22.36%. In addition to this, households with PLWD accounted to 7 %. The follow up on the type of disability resulted in 72.73% Lame, 22.73% Mute and 4.55% Deaf.

Proposed Mitigation Measures:

- *The project design should incorporate the PLWD need in the designs*
- *Vulnerable groups should be identified and accorded necessary assistance and support during the project's implementation.*
- *Preferential employment on construction works*
- *Establish register of vulnerable homesteads*
- *Skills training/enhancement*
- *Involve the vulnerable groups in decision making*
- *Implement further remedial measures where necessary*

7.24.7. Discrimination on Employment Opportunities

Most of the skilled labourers will have to be brought in from outside the project area, and this may cause some resentment among the local people. Generation of employment opportunities by the project could result to conflict between local residents and new comers or outsiders, if not appropriately managed. A concern expressed during consultations was that unskilled labour may be available to men more than women leading to gender discrimination. The community members were also concerned that the contractor may get both skilled and unskilled labour from elsewhere not within the project area. During the public participation the community reiterated that Kiambu County has both skilled and unskilled labour hence this should be obtained from within.

Mitigation Measures

- *To avoid conflicts with the local people on employment it is proposed that the Contractor employs the locals in liaison with local administration. The contractor is advised to be transparent and adopt a concentric model of recruitment to ensure equity.*
- *To promote the livelihood of vulnerable groups such as the women-headed households, there will be a need to undertake sensitization and awareness campaigns to the local community to promote gender equity in employment during the construction works.*

7.25. Impacts during decommissioning phase

The decommissioning process is part of a buildings or other infrastructure disposition. Disposition starts when the development's mission ends, or when other external factors dictate (such as acquisition of the land for expansion of a road) and may include dismantlement and release for reuse, or demolition and environmental restoration. During the decommissioning phase, all

buildings, infrastructure and related facilities at the site are dismantled and/or demolished safely and efficiently using appropriate procedures and work controls.

Decommissioning in the case of the proposed project refers to demolition of the buildings and environmental restoration. Demolition poses potential hazards, and also generates wastes which ought to be dealt with appropriately. Decommissioning impacts are closely related to the reason for the decommissioning and include but are not limited to:

7.25.1. Beneficial impacts

Decommissioning activities result in a creation of employment opportunities for workers involved in demolition and restoration activities. Demolition works also generate materials that can be reused or recycled, thus preserving some value, and reducing the need for virgin materials.

7.25.2. Adverse impacts in decommissioning

- *Decommissioning, and especially demolition activities, involve use of light and heavy machinery that generates noise and vibrations;*
- *Demolition activities generate rubble that requires proper disposal and can create health and safety hazards if inadequately managed;*
- *Demolition activities create occupational and public health and safety hazards with the likely occurrence of accidents involving workers/general public and machinery or rubble; and*
- *Demolition activities generate dust which if improperly managed can create health risks to workers and the general public, and cause stunted vegetation growth*.

7.25.2.1 Mitigation of decommissioning phase impacts

An EIA would be prepared prior to implementation of this plan, to assess and minimize potential environmental and social impacts arising from the decommissioning and abandonment operations. This decommissioning /abandonment EIA would be submitted to NEMA for approval.

The Proponent with the assistance of a Health, Safety, and Environment expert should develop environmental, health, and safety procedures for decommissioning, in keeping with the formulated Decommissioning Environmental Management Plan (DEMP). These procedures should, among other issues, address the following:

- *A Health and safety plan;*
- *The extent of decommissioning;*
- *Pollution prevention plans including air, water, and soil pollution prevention plans;*
- *Waste management plans; and*
- *Restoration plans.*

At the end of decommissioning works, the Proponent should obtain certificates of completion from all the necessary authorities including NEMA.

8. CULTURAL HERITAGE

The project area is within the Kiambu County and is predominantly comprised of the Kikuyu Ethnic Community. In the project site, there was a Mugumo tree. Ancient Kikuyu tradition holds this tree as a sacred tree. Some people believe that the spirits of the ancestors' dwell in Mugumo trees and its canopy has been used as a shrine to offer prayers and sacrifices to gods. For generations, the Mugumo has occupied mythical place among the Gikuyu who consider it sacred because it was thought that spirits, especially deceased ancestors, dwelt in this tree.

The tree is not planted but grows widely in fertile and moist areas especially near rivers. It is believed that the tree is planted by God and it should not be cut under any circumstances.

The Mugumo tree at the proposed construction site had to be cut to pave way for the construction of the proposed project. Before the tree was cut, the elders were notified through the local administration and a ceremony was held at the proposed site. The elders did not allow minutes to taken or videography since the traditions could not allow. Very limited pictures were allowed. The attendance list of those who attended the ceremony is herewith attached to this report.

Plate 6: Ceremony held before the Mugumo tree was cut

9. COMPLAINTS AND GRIEVANCE HANDLING MECHANISMS

9.1. Introduction

This Chapter looks at the ways/procedures to be followed in handling complaints and grievances during the construction and operation phase of the proposed project. The report has reviewed and analysed the socio-cultural contexts of conflict resolution in Kiambu County.

9.2. Socio-Cultural Context to Conflict Resolution

The project area, Kiambu County is predominantly comprised of the Kikuyu Ethnic Community. This is important in that culturally, there are mechanisms in place in most rural and urban areas used in conflict resolution. These village elders do double as Nyumba Kumi representatives even in urban areas, they therefore work hand in hand with chiefs in conflict resolution.

Apart from these village elders there are administrative leaders starting with chiefs and assistant chiefs up to the county commissioners who together solve most of the complaints and grievances. Formerly provincial administration, they have been incorporated into the new dispensation and aide in maintaining law and order in every county.

9.3. Development of General Principles of Grievance Redress

The Social Impact Assessment has the following principles aimed at ensuring grievance and complaints handling mechanisms are ethical and with integrity:

- Equity – everyone will be given a chance to be heard even in situations that will require a complaint to be written when some cannot write. Mechanisms must be put in place to allow proxies draft complaints for complainants who cannot write.
- Transparency – grievance and complaints will be handled openly before elders or other formal institutions.
- Language – the language used in solving these disputes shall be that which is used by most people in the affected area, this will be Kiswahili. Those not able to neither write or read in this language will be provided by the project to grasp what is written that affects them.
- Participation – the affected persons and their representatives in a dispute will be allowed to help actors understand where the community members stand in regards to that dispute.
- Options – parties to any dispute will be given options openly to follow customary procedures or formal procedures and allowed to choose whichever they feel is appropriate.
- Monitoring – grievances and courses of action will be monitored to ensure they are settled within the shortest possible time.

9.4. Chiefs and Elders in Project Area

They should form the first level of grievance and conflict resolution; they should be facilitated to deal with matters within 30 days of being seized of. The Chief and Village elders form part of the resolution team. Chief represent the formal procedures while village elders represent customary procedures. In most cases the Chiefs work in liaison with their village elders therefore formally

and customarily the committees formed to resolve conflicts will have appropriate backings by law and customs.

10. SOCIAL MONITORING AND MANAGEMENT PLAN

10.1. Monitoring and Management Plan

The Social Monitoring and Management Plan (SMMP) is prepared to show how site-specific concerns and mitigation measures are addressed throughout the lifecycle of the proposed project. The SMMP has been developed with project knowledge and information available to date. As project commencement and scheduling plans are developed and changed, components of the SMMP might require amending. This is therefore a working document, which can be updated whenever new information is received or site conditions change.

10.2. Purpose and objectives of SMMP

The specific objectives of the SMMP are to:

- Provide detailed specifications for the management and mitigation of activities that have the potential to impact negatively on the society;
- Serve as a reference and commitment by the contractor as it includes conditions of approval from NEMA which have to be met;
- The SMMP is a guiding document in regards to social monitoring activities to be used by the supervising consultant, contractor and the client management including requisite progress reports;
- The SMMP provides details on how the project implementers can enhance some of the positive impacts of the project in order to better the lives of affected community;
- Provide instructions to relevant project personnel regarding procedures for protecting the social welfare and minimizing negative social effects, thereby supporting the project goal of minimal or zero incidents;
- Document social concerns and appropriate protection measures; while ensuring that corrective actions are completed in a timely manner.

10.2.1. Auditing of the SMMP

The proponent and the contractor shall conduct regular audits to the SMMP to ensure that the system for implementation of the SMMP is operating effectively. The audit shall check that a procedure is in place to ensure that:

- An up-to-date version of the SMMP is being used;
- Any variations, non-compliance and corrective actions to the SMMP are documented;
- Appropriate training of personnel is regularly undertaken, such as safety etc.;
- Emergency procedures are in place and effectively communicated to personnel;
- A register of major incidents (spills, injuries, complaints) is in place and other documentation related to the SMMP;
- Ensure that appropriate corrective and preventive action is taken by the Contractor once instructions have been issued.

10.3. Responsibilities of the SMMP

In order to ensure the sound development and effective implementation of the SMMP, it will be necessary to identify and define the responsibilities and authority of the various persons and Organizations which will be involved in the project. The following entities should be involved in the implementation of this SMMP:

- The Contractor;
- The proponent;

- NEMA;
- The consultants;
- County Government of Kiambu.

A. The proponent

The proponent will be charged with the responsibility of supervision to ensure the project is implemented in a sustainable manner; this includes environmental, social and fiscal.

This can be achieved by putting measures encouraging sustainability and social inclusion in the tender specifications, selection of renowned socially and environmentally conscious contractors to ensure that the objectives of this ESMMP are met. As an authority and instrument of the Government of Kenya the proponent is also tasked at ensuring the project is up to standard.

B. National Environment Management Authority

The responsibility of NEMA as an Authority is to exercise general supervision and co-ordination over all matters relating to the environment and to be the principal instrument of Government of Kenya in the implementation of all policies relating to the environment.

C. The Contractor.

The persons/ firms contracted to put up the proposed residential project will be required to comply with the requirements of the SMMP within this report. Strict compliance to the specifications of this SMMP should form part of the contract documents.

D. Consultants

The sourced consultant will have to ensure that the proposed ESMMP is up to date and is being used by the contractor. Periodic audits of the ESMMP will have to be done to ensure that its performance is as expected.

***E.* Kiambu County Governments**

The relevant departmental officers in the County Government of Kiambu should be called upon where necessary during project implementation to provide the necessary permits and advisory services to the project implementers.

Table 6, below present the ESMMP for the project during the construction, operation and decommissioning phases

10.4. Environmental Social Management Plan (ESMP)

The table 6 below gives specification of the environmental and social impacts that the project has on the proposed site and the possible mitigation measures monitoring actions required ensuring minimal damage of the environment and to the social fabric both during the construction, operational and decommissioning phase.

Table 11:The Environmental and Social Management Plan (ESMP)

CONSTRUCTION PHASE

ASPECT	Source	POTENTIAL IMPACT	RECOMMENDED MITIGATIVE MEASURE	TIMING	RESPONSIBLE PARTY	COST (KSH.)	PERFORMANCE INDICATOR
General site management	General construction activities; unsafe site conditions; unsafe acts and practices	Accidents with potential to cause physical injury, damage to property; environmental pollution	Provide Environmental, Health and Safety training to workers to ensure that they understand the requirements of the environmental, health and safety management plans as applicable to their responsibilities	Construction Phase	Contractor	150,000	Trainings carried out on the ESMP Signed code of conduct by workers
			Ensure that workers sign a code of conduct to observe established procedures and are well behaved towards the surrounding community				
Visual and landscape management	Site clearance; Excavations; alteration of ground level; piling of spoils on site	Loss of vegetation; soil erosion; siltation of water courses; loss of aesthetic value	Maintain as much as possible the natural drainage systems and patterns;	Construction Phase	Contractor	100,000	Non-interference with drainage patterns;
			Where possible, commence landscaping activities as soon superstructures are erected;				
			Set out a plan for re-vegetation of disturbed areas				
			Preserve the existing natural vegetation as much as possible				
Air quality management	Earthworks; vehicle movements; transportation of materials and wastes; running of engines and motors	Local air pollution by dust and exhaust fumes; potential respiratory illnesses among impacted neighbours	Sprinkle water on work areas, and materials heaps to minimize dust emissions;	During Construction Phase	Contractor	50,000	Dust levels at the site andaccesses; Regular maintenance of vehicles; Type of fuel in use; Existence and usage of PPE including dust masks by workers
			Maintain equipment and machinery to manufacturers' specifications by regular servicing to maintain efficiency in combustion and reduce carbon emissions;				
			Use environmentally friendly fuels such as low Sulphur diesel; Provide appropriate Personnel				
			Protective Equipment such as dust masks to site workers				
Energy	Use of fossil fuel-	Increased demand on	Maintain equipment and machinery to manufacturers' specifications by regular servicing to maintain	During Construct	The Contractor.	100,000	Established maintenance

ASPECT	Source	POTENTIAL IMPACT	RECOMMENDED MITIGATIVE MEASURE	TIMING	RESPONSIBLE PARTY	COST (KSH.)	PERFORMANCE INDICATOR
management	ran and/or electricity-ran equipment in construction works	fossil fuel and electricity to run equipment	efficiency in combustion and reduce carbon emissions; Use environmentally friendly fuels such as low Sulphur diesel; Specify and procure the most energy efficient plant options fit for purpose and avoid use of plant with unnecessary and excess capacity;	ion Phase			schedules for equipment in use; Type of fuel in use on equipment; List of requirements for each type of equipment
Noise and vibrations management	Noise emissions by construction equipment and activities	Nuisance to surrounding communities	Reduce idling time on trucks and other noisy equipment; Encourage drivers to turn off vehicle engines when not in use and avoid unnecessary hooting/ revving of engines; Provide personal protective equipment such as ear muffs to workers at the site as necessary; Carry out construction work during the day only. No works shall be carried out on Sundays	Construction phase	Contractor	80,000	Presence of noise attenuation features on equipment; Existing practices and awareness of operators about machinery idling; Existence and usage of PPE including earmuffs by workers; Defined construction hours of between 7am and 6pm
Traffic management	Construction vehicles movements in the project area	Accidents involving the surrounding community; Nuisance from snarl ups	Contractor shall ensure that construction traffic movement does not coincide with the known rush hours in the project area, and that speed and loading limits are observed; Develop a traffic management plan to ensure that site vehicles do not interfere with the regular traffic on the access roads, or pose safety hazards to site workers or the general public; Set up traffic control/warning signs along the access road near the site entrance informing other motorists of potential hazards of construction vehicles turning	Construction phase	Contractor	50,000	Delivery times for materials and carting of wastes; established speed limits; Established Traffic management plan; Erected warning signage at critical areas

ASPECT	Source	POTENTIAL IMPACT	RECOMMENDED MITIGATIVE MEASURE	TIMING	RESPONSIBLE PARTY	COST (KSH.)	PERFORMANCE INDICATOR
Water resource management	Construction water needs; generation of wastewater during construction works	Increased demand in the project area; contamination of surface and ground water resources	Ensure that water is used efficiently by avoiding extravagant water use and wastage; Harvest storm water wherever possible to supplement other sources of water; Channel construction wastewater into temporary holding ponds to allow sedimentation before release in to the environment; Recycle and reuse construction wastewater wherever possible	Construction phase	Contractor	50,000	Continuous review of usage and water requirements; Monthly review of opportunities for reuse or used of recycled water; River Getathuru water analysis after a period of time.
Waste management	Use of materials in construction; rejection of defective construction materials; packaging of materials	Generation of construction wastes that cause environmental pollution, nuisance and breeding grounds for vermin	Identify a temporary holding area for construction wastes; Recycle and re-use construction waste as much as possible; Washing of concrete-coated vehicles/equipment off-site or in a designated area. The concrete wash area will be at least 50m away from storm drain inlets or open drainage facilities. Runoff from onsite concrete wash area shall be contained in a temporary pit where concrete can set; Surface runoff within the site to be diverted in order to avoid flushing away soil and other material. Sediment traps to also be installed to remove sediments before discharge of the runoff from the site;	Construction phase	Contractor	100,000	Identified area for storage of Wastes; Amount of recycled wastes atthe site; Designated wash area; an existent concrete washout pit atthe site; Installed sediment traps; lined drain for channelling of runoff;
Health and safety management	Use of hand tools and machinery in construction; construction vehicle movements; housekeepi	Physical injuries to workers and/or the public; damage to property	Comply with the requirements of OSHA, 2007; Provide for appropriate signage and warnings in work areas; Provide appropriate personnel protective equipment (PPE) to site workers; Provide for First Aid facilities as per the OSHA, 2007, and ensure that workers are trained on emergency response such as first aid skills; Provide and clearly display emergency contacts on site;	Construction phase	Contractor	50,000	Level of compliance with OSHA provisions; Hoarded and restricted construction site; Installed warning signage; Appropriate PPE

ASPECT	Source	POTENTIAL IMPACT	RECOMMENDED MITIGATIVE MEASURE	TIMING	RESPONSIBLE PARTY	COST (KSH.)	PERFORMANCE INDICATOR
	ng practices at the constructio n site; unsafe acts by constructio n workers		Provide adequate sanitary facilities on site; Develop and implement a detailed and site-specific Emergency Response Plan Routine medical examinations shall be done for all construction crew staff at local health centres				providedto workers; Trained first aider(s) among workers; fully stocked first aid kit at the construction site; Displayed emergency contacts at the site; Provided toilets and handwashing water at the site; Operational emergency response plan;

Table 12: Operation phase management plan

ASPECT	Source	POTENTIAL IMPACT	RECOMMENDED MITIGATIVE MEASURE	TIMING	RESPONSIBLE PARTY	COST (KSH.)	PERFORMANCE INDICATOR
Noise management	Use of the standby power generator during grid-power outages	Noise nuisance	Ensure that noise abatement devices are installed and maintained for the standby generator for power supply	Operation Phase	Estate Managers	50,000	Noise levels from the standby generator when in use
Energy resource management	Use of electrical appliances; Lighting within the development	Increased demand on grid energy supply	Encourage residents to conserve energy through awareness programs; Install and maintain energy efficient appliances e.g., indoor lights and outdoor security lights; Continually seek avenues for energy conservation as international best practices evolve;	Operation and construction Phase	Estate Managers	100,000	Instituted awareness and conservation program; Installed energy efficient lighting; Other energy-saving measures instituted
Water resource management	Usage of water by residents	Increased water demand; Increased generation of wastewater	Encourage Residents to conserve water through awareness programs; Install and maintain low volume fixtures in toilets, baths and other wet areas; Use harvested storm water in cleaning and irrigation of lawns;	Operation and construction Phase	Estate Managers	50,000	Installed water meters; Installed water meters; Use of harvested stormwater around the compound
Waste management	Occupation of the housing by the residents; consumption/use of materials	Generation of wastes; environmental pollution and creation of health and safety	Pursue waste minimization at source principles e.g., zero generation, reduction, re- use and/or recycling; Provide mechanisms to segregate wastes at source, ensure that all wastes are stored temporarily at the designated common collection area, and that they are regularly carried away for disposal in designated areas;	Operation Phase	Estate Managers	50,000	Implemented measures for reuse/recycling at household level; Established mechanisms that allow segregation; Contracted waste handler; waste collection schedule; Maintenance/inspection schedule; Blockage

ASPECT	Source	POTENTIAL IMPACT	RECOMMENDED MITIGATIVE MEASURE	TIMING	RESPONSIBLE PARTY	COST (KSH.)	PERFORMANCE INDICATOR
		hazards from mismanagement of wastes	Ensure regular inspection and maintenance of foul water drainage works and storm water drainage works at the premises to prevent clogging, and fore-stall breakdowns.				incidences
Occupational/ public health and safety	Maintenance activities within the property; Installations such as electric fence; Manholes, trenches or other features; Flames and flammable substances within houses	Accidents causing injuries; fire incidences with potential to cause damage to property and/or loss of life	Comply with the requirements of the OSHA 2007; Provide for the appropriate signage and warnings in potential risk areas; Provide appropriate Personnel Protective Equipment (PPE) to maintenance staff at the premises where applicable; Install firefighting equipment at strategic places within the property Develop and implement detailed and site-specific emergency response plans	Operation Phase	Estate Managers	50,000	Compliance level with OSHA provisions; Installed warning signage at risk areas; Availability of PPE and usage during maintenance works; Installed firefighting equipment at the premise; An established Emergency Response Plan for identified hazards
Traffic management	Movement of vehicles and pedestrians in and out of the premises	Accidents involving pedestrians and/or motor vehicles	Develop and maintain a traffic management plan that caters for vehicular and pedestrian traffic associated with the development especially at the main entrance to the property;	Operation Phase	Estate Managers	30,000	Established Traffic Management Plan; Traffic incidents related to the development
TOTAL							**1,060,000**

Table 13: Decommissioning phase management plan

ASPECT	SOURCE	PROPOSED MITIGATION MEASURES	RESPONSIBILITY	TIMING	MONITORING INDICATORS
Demolition waste management	Demolition waste	Use of an integrated solid waste management system i.e., through a hierarchy of options: 1. Source reduction 2. Recycling 3. Composting and reuse 4. Combustion 5. Sanitary land filling; All buildings, machinery, equipment, structures and partitions that will not be used for other purposes must be removed and recycled/reused as far as possible 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	Project Manager & Contractor	During decommissioning	Quantity of waste generated; Quantity of recovered material that can be recycled;
Rehabilitation of project site	Site degradation	Implement an appropriate re-vegetation programme to restore the site to its original status; Trees should be planted at suitable locations so as to interrupt slight lines (screen planting), between the adjacent area and the development	Project Manager & Contractor	During decommissioning	Area of and that has been re-vegetated

11. PROJECT IMPACT MONITORING AND EVALUATION FRAMEWORK

11.1. Monitoring and Evaluation Components

Monitoring and Evaluation (M&E) constitutes the verification of attainment of targets set in regards to the mitigation measures of the proposed project.

11.2. Monitoring and Evaluation Objectives

The objectives of the M&E will be to:

- Follow and record the perception of the locals towards the project during its implementation phase.
- Track project's compliance with proposed mitigation measures with regards to socio-cultural and environmental aspects.
- To determine the impact of the proposed project on wellbeing of locals.

11.3. Detailed Monitoring and Evaluation Plan

Participatory approaches will be used by the team so as to ensure the locals have equal opportunity to participate in project organization. The plan will be developed jointly between the project team and locals.

11.4. Compliance and Completion Audits and outcome evaluation

The proponent will engage an independent auditor during design to formulate mitigation measures culturally compliant with the locals' situation.

11.5. Monitoring and Evaluation Responsibilities

Table 14: Social Monitoring Plan for the project

Environmental Component	Parameter	Standard	Location	Frequency	Duration	Implementation
Employment Opportunities	Percentage of local construction Workers	Employment programme developed	Project site	Quarterly	Construction phase	Contractor
Population Influx	People	Number of people	The project area	Quarterly	Construction phase	Contractor
Noise Levels	Noise levels on dB (A) Scale	NEMA/OSHA Guidelines	Noise level meter kept at a distance of 15m from the construction site	As directed by the supervision consultant	Readings to be taken at 15 second interval for 15 min every hour and then averaged	Contractor and EHS officer
	Noise levels on Deci Bells (dB) (A) scale	NEMA guidelines	At equipment yards	Monthly as required by the supervision consultant	Construction phase	Contractor and EHS office
Solid waste	Slag, domestic refuse, metallic scraps, sludge	Volume of solid waste	Disposal sites, Project area	Quarterly	Throughout the project construction and decommissioning	Contractor and EHS officer
Air quality	Methane, (CH_4) Carbon Dioxide, (CO_2) Hydrogen Sulphide (H_2S, Total Suspended Particles (TSP)	Within standard limit levels	Project area	Daily	Throughout the project construction	Contractor and EHS officer
Accidents	Safety training for workers, accident reports, insurance cover, compensation, community Consultations, Provision and use of Material Safety Data Sheets (MSDS) for all toxic substance used.	ESMP	At the construction site	Weekly	Throughout the project construction and decommissioning	Contractor and EHS officer
Health	Signs, posters displayed, health awareness lectures, mosquito nets in Malarial areas for each worker, health checks for workers.	ESMP	At the construction site and surrounding areas	Weekly	Throughout the project construction and decommissioning	Contractor and EHS officer

Key: CO2 = Carbon dioxide, **H2S** = Hydrogen sulphide, **CH4** =methane**, dB** = decibel, **TSP** = Total suspended particles.

12. CONCLUSION AND RECOMMENDATION

The objective of the study was to provide not only the client with significant and sufficient information about the proposed residential project but also institutions and relevant authorities. It is hoped that this information will be used to evaluate whether the proposed project is likely to have significant negative socio-economic and cultural impacts that outweigh the positive impacts. It is anticipated that the proposed development project would bring substantial economic benefits not only to the local communities within the project area, but to the entire nation as a whole.

After the mitigation proposed in this study it is unlikely that this project will have significant adverse social and environmental impacts. Most adverse impacts will be of a temporary nature during the construction phase and can be managed to acceptable levels with implementation of the recommended mitigation measures for the Project such that the overall benefits from the Project will greatly outweigh the few adverse impacts.

These are the recommendations of this Environmental and Social Impact Assessment study (ESIA):

- *To address potential child labour during the construction phase, the contractor is encouraged to ensure consultations with the public and other players such as NGOs, Child Protection Services and Education sector. Training and talks with the workers regarding money management to be done by the proponent; this will go a long way in reducing the spend thrift culture in such camps thereby reduce the allure associated with such works.*
- *In regards to increase in HIV&AIDS prevalence and early pregnancy cases. Training and awareness creation in the project area in regards to HIV&AIDS should be conducted.*
- *The project should consider implementing considerable Corporate Social Responsibility (CSR) proposals recommended*
- *It is recommended that the project proceed as planned with the mitigation measures integrated in its implementation. In addition to this the project to be implemented in compliance with all the relevant legislations as proposed at all phases of the project implementation.*

The consults recommend that NEMA approves the project and subsequent issuance of ESIA licence based on the proposed mitigative measures illustrated in this report.

13. REFERENCE

1) Kenya National Bureau of Statistics (2019)

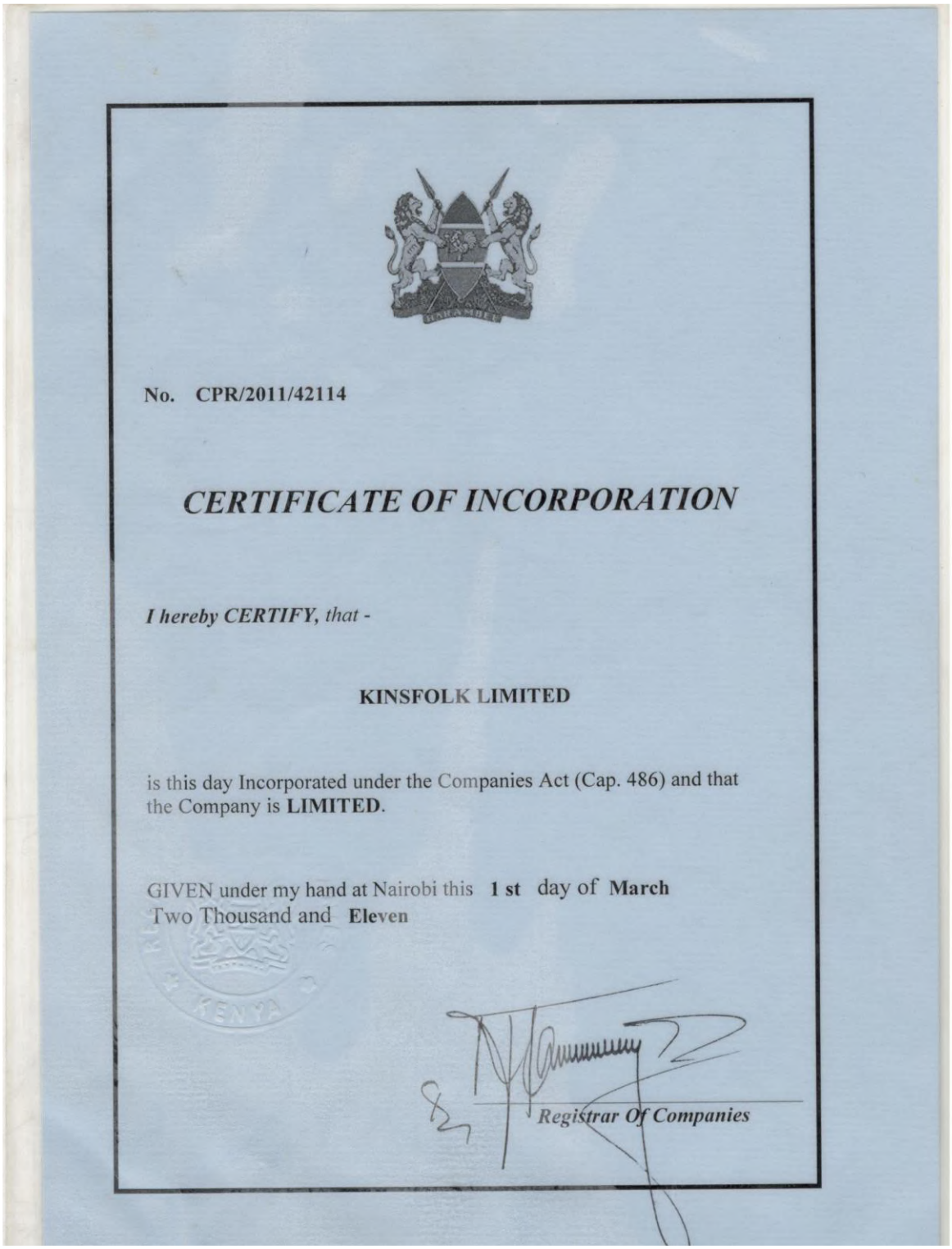
2) Kiambu County Integrated Development Plan 2018-2022.

3) NASCOP (2016): Kenya HIV County Profiles 2016. Ministry of Health, National AIDS Control Council.

4) The laws of Kenya. Retrieved from http://www.kenyalaw.org/lex//index.xql

14. APPENDICES

Appendix I: KINGSFOLK Certificate of Incorporation



No. CPR/2011/42114

CERTIFICATE OF INCORPORATION

I hereby CERTIFY, *that* **-**

KINSFOLK LIMITED

is this day Incorporated under the Companies Act (Cap. 486) and that the Company is **LIMITED**.

GIVEN under my hand at Nairobi this **1 st** day of **March** Two Thousand and **Eleven**

Registrar Of Companies

Appendix II: Experts NEMA Licenses

FORM 7 (r.15(2))

nema

mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16691

Application Reference No: NEMA/EIA/EL/21683

M/S **HAPPY FOREST LIMITED**
(individual or firm) of address

P.O. Box 45947-00100 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Firm of Experts**
registration number **9446**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/3/2022** Expiry Date: **12/31/2022**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16760

Application Reference No: NEMA/EIA/EL/21622

M/S **John M. Mukundi**
(individual or firm) of address

P.O. Box 6779-01000 THIKA

is licensed to practice in the capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**

registration number **1313**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/11/2022** Expiry Date: **12/31/2022**

Signature…..

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001:2015 Certified

FORM 7 (r.15(2))

nema
mazingira yetu | uhai wetu | wajibu wetu

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/16690

Application Reference No: NEMA/EIA/EL/21682

M/S **ALLAN OWINO OTIENO**
(individual or firm) of address

P.O. Box 45947-00100 NAIROBI

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **6023**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **3/3/2022** Expiry Date: **12/31/2022**

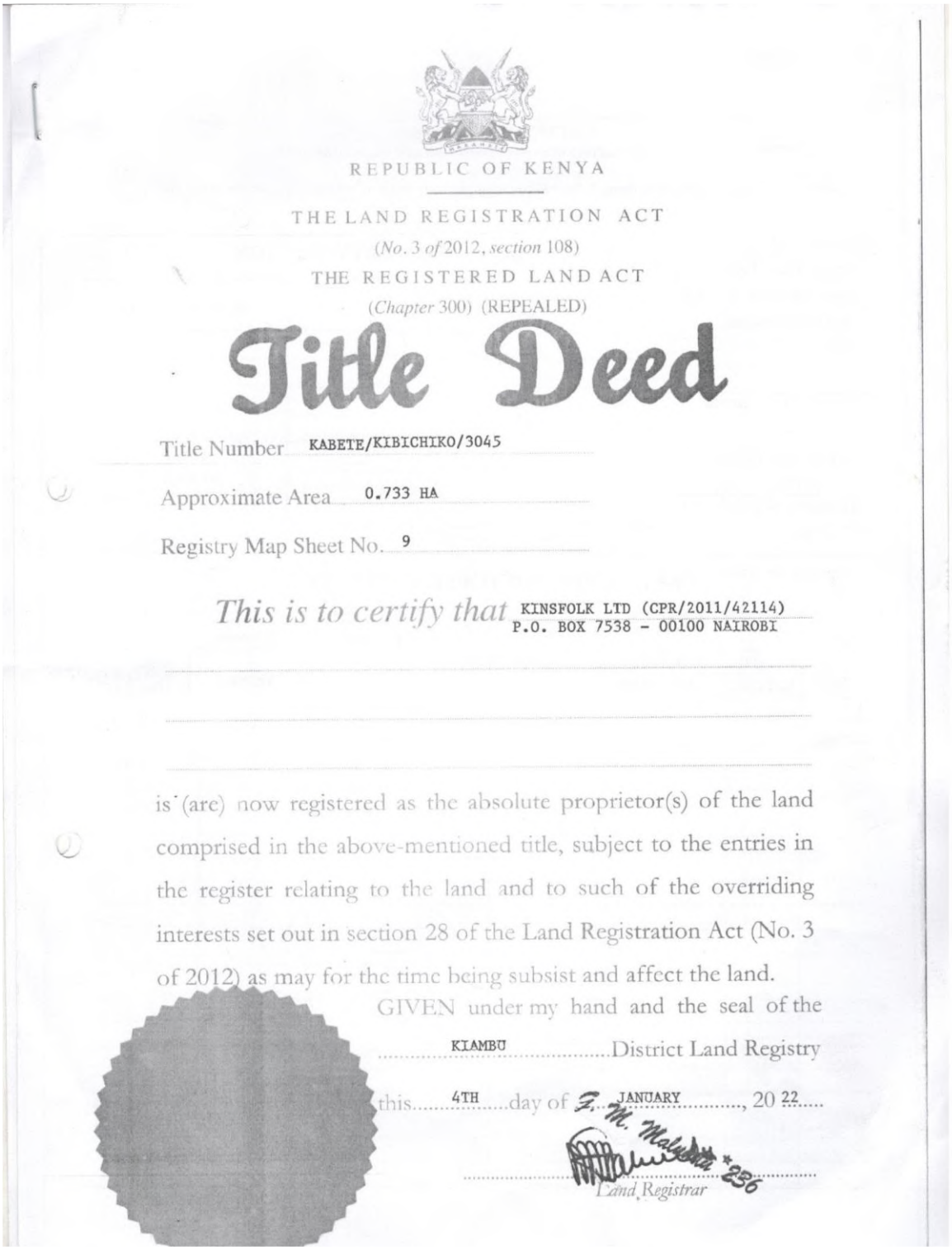
Signature…..

(Seal)
Director General
The National Environment Management Authority

P.T.O.

ISO 9001: 2015 Certified

Appendix III: Copy of land ownership document



REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Title Number KABETE/KIBICHIKO/3045

Approximate Area 0.733 HA

Registry Map Sheet No. 9

This is to certify that KINSFOLK LTD (CPR/2011/42114)
P.O. BOX 7538 - 00100 NAIROBI

is (are) now registered as the absolute proprietor(s) of the land comprised in the above-mentioned title, subject to the entries in the register relating to the land and to such of the overriding interests set out in section 28 of the Land Registration Act (No. 3 of 2012) as may for the time being subsist and affect the land.

GIVEN under my hand and the seal of the

KIAMBU District Land Registry

this 4TH day of JANUARY, 20 22

F. M. Maluvitta * 256

Land Registrar

(To be completed only when the applicant has paid the fee of Sh. 125)

At the date stated on the front hereof, the following entries appeared in the register relating to the land:

EDITION: 1
OPENED: 28.6.2013

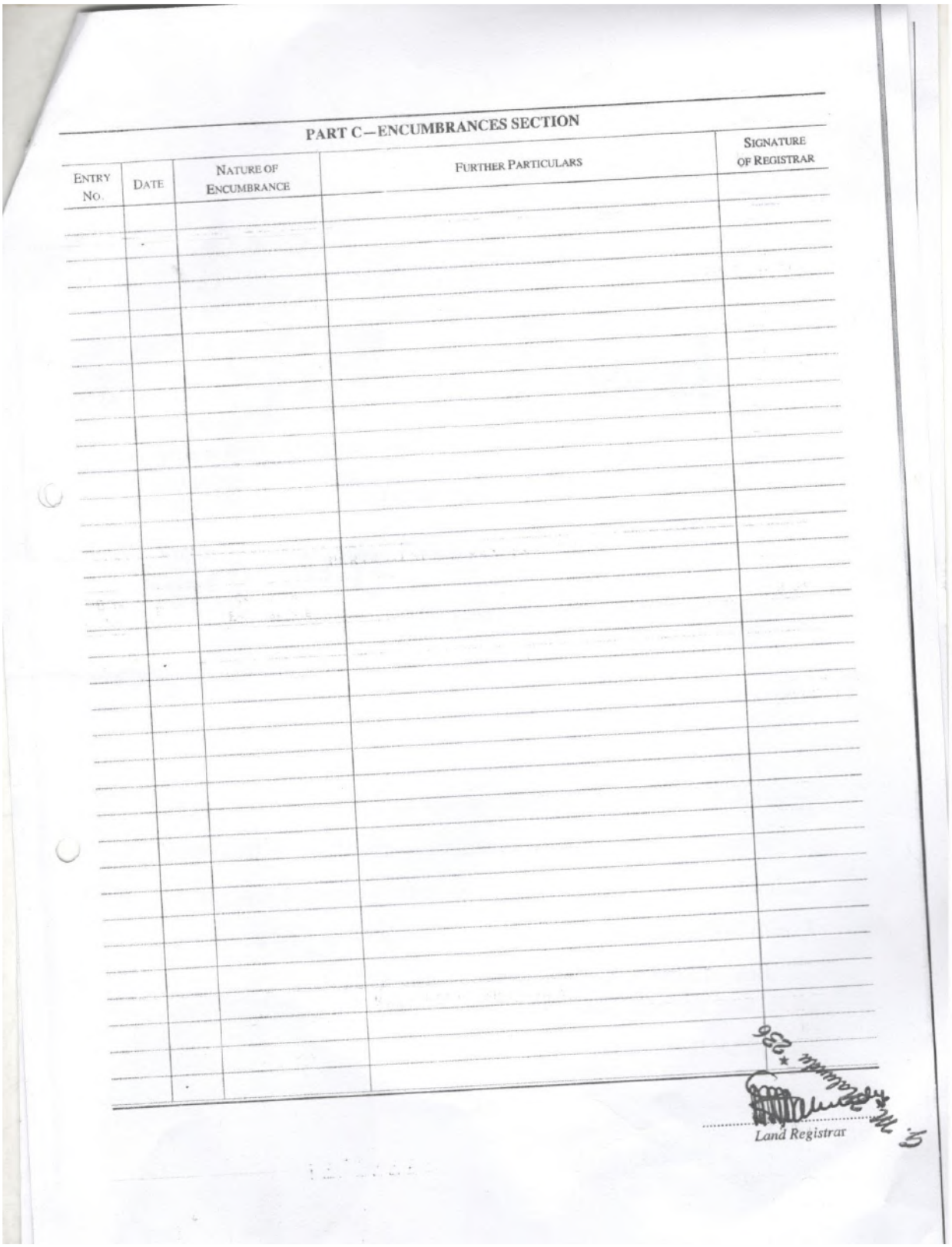
PART A—PROPERTY SECTION

REGISTRATION SECTION	EASEMENTS, ETC.	NATURE OF TITLE
KABETE/KIBICHIKO		
PARCEL NUMBER		
3045		
APPROXIMATE AREA		ABSOLUTE
0.733 Ha.		
REGISTRY MAP SHEET No.		
9		

SUBDIV OF 2926

PART B—PROPRIETORSHIP SECTION

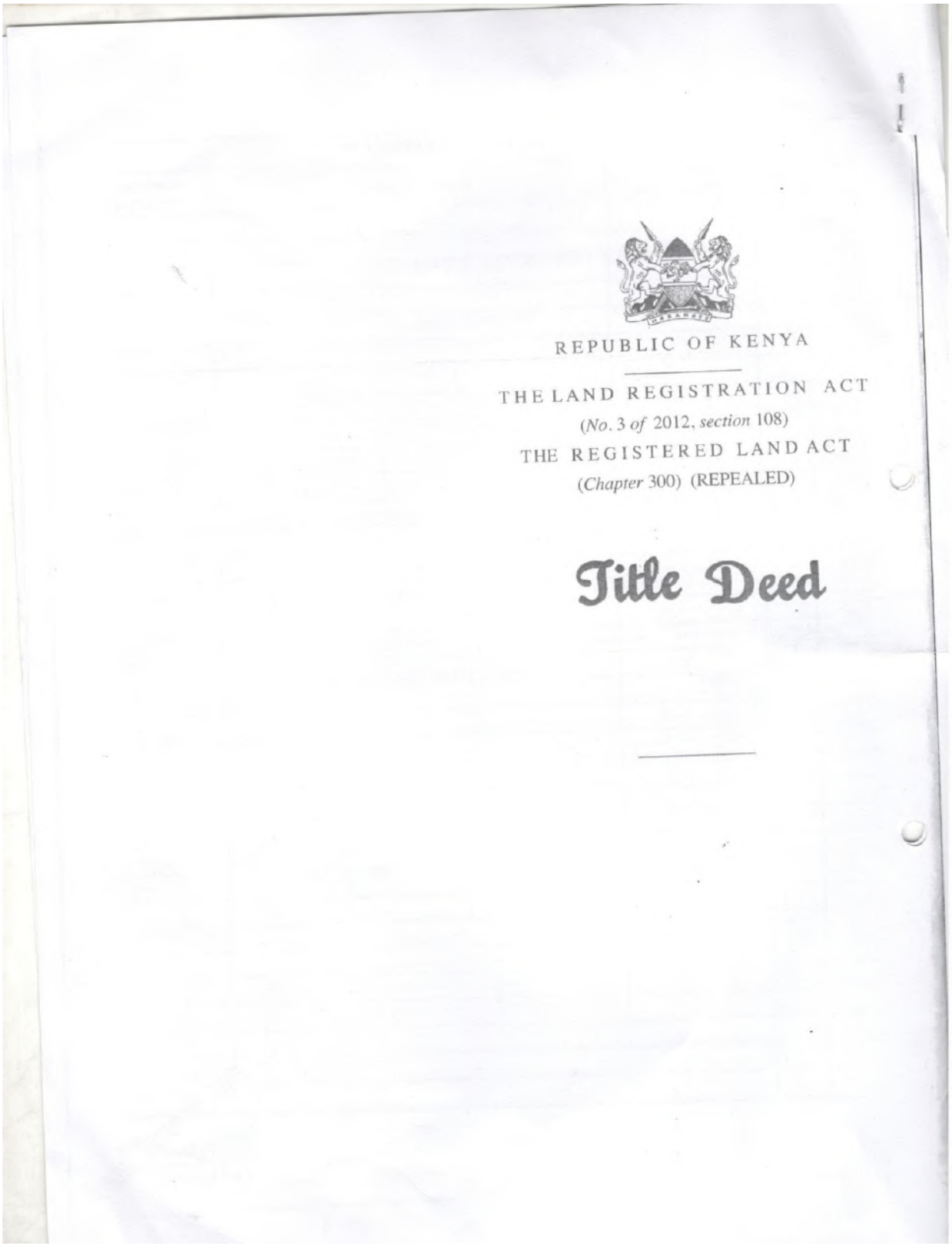
ENTRY NO.	DATE	NAME OF REGISTERED PROPRIETOR	ADDRESS AND DESCRIPTION OF REGISTERED PROPRIETOR	CONSIDERATION AND REMARKS	SIGNATURE OF REGISTRAR
7.	4.1.2022	KINSFOLK LTD (CPR/2011/42114)		ISSUED	
8.	4.1.2022	TITLE DEED			



PART C—ENCUMBRANCES SECTION

ENTRY NO.	DATE	NATURE OF ENCUMBRANCE	FURTHER PARTICULARS	SIGNATURE OF REGISTRAR

Land Registrar



REPUBLIC OF KENYA

THE LAND REGISTRATION ACT

(*No.* 3 *of* 2012, *section* 108)

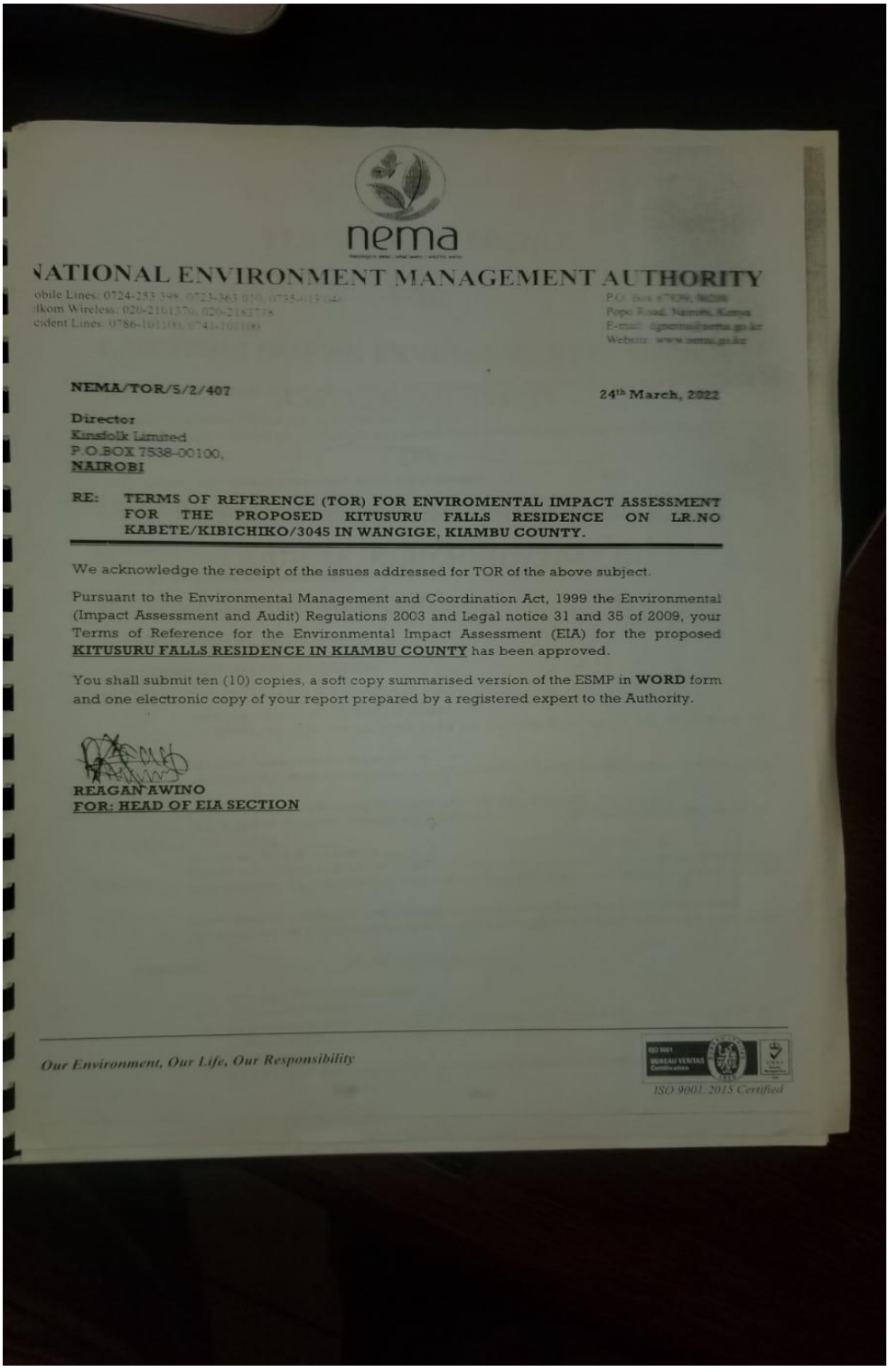
THE REGISTERED LAND ACT

(*Chapter* 300) (REPEALED)

Title Deed

Appendix IV: Copy of Preliminary Design Drawings

Appendix V: NEMA approved TOR



nema

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

obile Lines: 0724-253 398, 0723-363 010, 0735-013 [illegible]
lkom Wireless: 020-2101370, 020-2183718
cident Lines: 0786-101100, 0741-101100

P.O. Box [illegible]
Popo Road, Nairobi, Kenya
E-mail: [illegible]
Website: www.nema.go.ke

NEMA/TOR/5/2/407 24th March, 2022

Director
Kinsfolk Limited
P.O.BOX 7538-00100,
NAIROBI

RE: TERMS OF REFERENCE (TOR) FOR ENVIROMENTAL IMPACT ASSESSMENT FOR THE PROPOSED KITUSURU FALLS RESIDENCE ON LR.NO KABETE/KIBICHIKO/3045 IN WANGIGE, KIAMBU COUNTY.

We acknowledge the receipt of the issues addressed for TOR of the above subject.

Pursuant to the Environmental Management and Coordination Act, 1999 the Environmental (Impact Assessment and Audit) Regulations 2003 and Legal notice 31 and 35 of 2009, your Terms of Reference for the Environmental Impact Assessment (EIA) for the proposed **KITUSURU FALLS RESIDENCE IN KIAMBU COUNTY** has been approved.

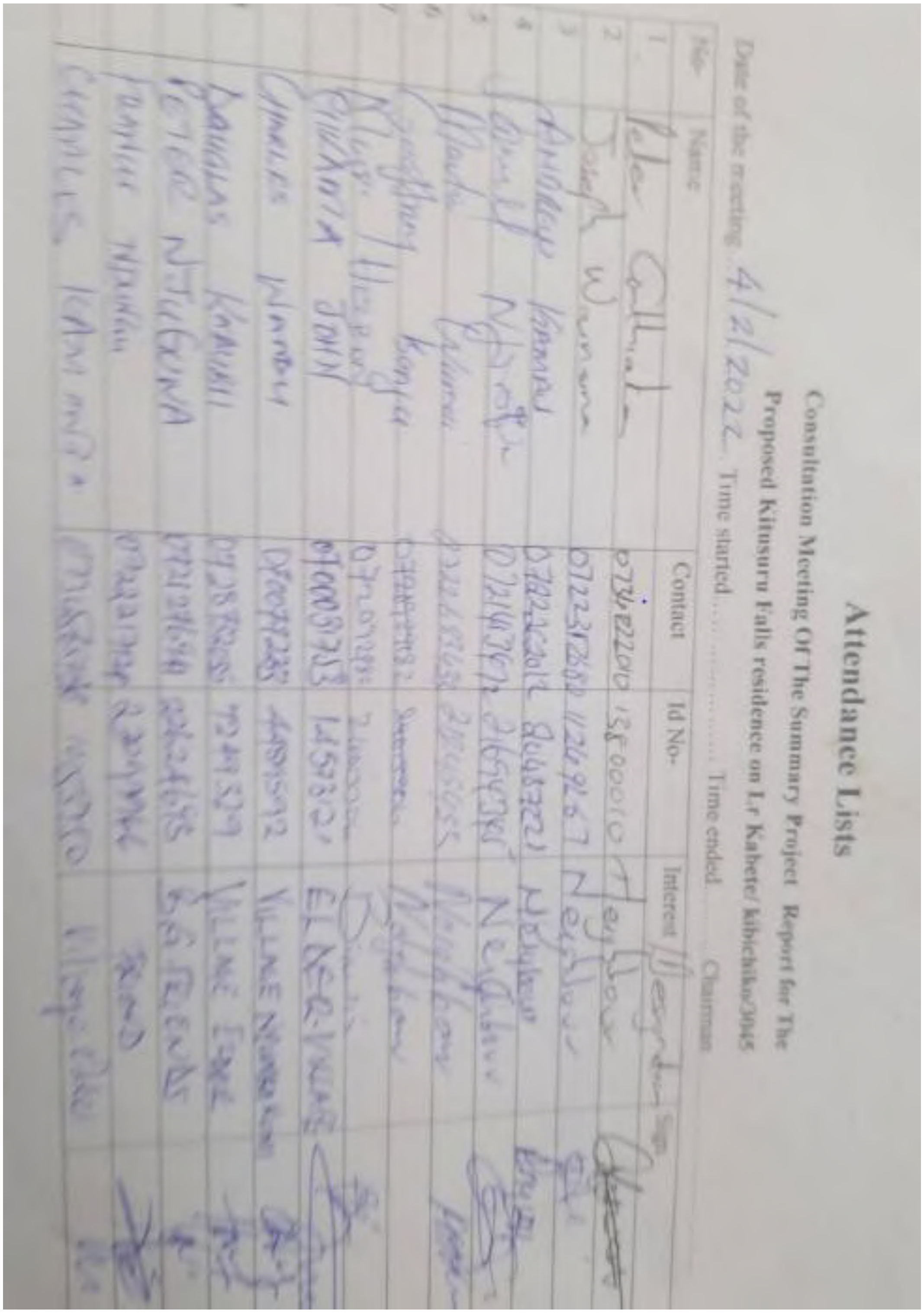
You shall submit ten (10) copies, a soft copy summarised version of the ESMP in **WORD** form and one electronic copy of your report prepared by a registered expert to the Authority.

REAGAN AWINO
FOR: HEAD OF EIA SECTION

Our Environment, Our Life, Our Responsibility

ISO 9001:2015 Certified

Appendix VI: List of attendance for Mugumo tree cleansing ceremony.



Attendance Lists

Consultation Meeting Of The Summary Project Report for The Proposed Kitusuru Falls residence on Lr Kabete/ kibichiko/3045

Date of the meeting 4/2/2022 Time started .... Time ended .... Chairman

No	Name	Contact	Id No	Interest	Sign
1	[illegible]	[illegible]	[illegible]	Neighbour	[illegible]
2	Joseph W [illegible]	[illegible]	[illegible]	Neighbour	[illegible]
3	Andrew [illegible]	[illegible]	[illegible]	Neighbour	[illegible]
4	David Njoroge	[illegible]	[illegible]	Neighbour	[illegible]
5	[illegible]	[illegible]	[illegible]	Neighbour	[illegible]
6	Geoffrey [illegible]	[illegible]	[illegible]	Neighbour	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible] John	[illegible]	[illegible]	Elder [illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	Village [illegible]	[illegible]
	Douglas Kamau	[illegible]	[illegible]	Village Elder	[illegible]
	Peter Njuguna	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Charles [illegible]	[illegible]	[illegible]	Village Elder	[illegible]

14	Salome Mukuhi Kaguathi	0712733961 Contact	14405716	Neighbour	
15	Racheal Nyambura wawaru	0792563501	34221872	Neighbour	
16	Sarah Mucubia	0715607006	31903493	Neighbour	
17	George Kanja Gitungo	0733750090	0998331	Neighbour	
18	JUSTUS MBOYA	0721207081	23021246	FRIEND	
19	GEORGE N. MUIRURI	0750404090	13214252	ELDER	
20	HENRY MWAURA	0720296224	5697437	Chairman locals	
21	JOHN G KABURU	0721590071	0313201	CHAIRMAN [illegible]	
22	SIMON KIMANI	0722815908	18998527	proponent	
23	DAVID W gangi [illegible]	0721955781	1640516	ELDER	
24					
25					
26					
27					
28					
29					
30					

Appendix VII: List of attendance for public baraza

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY REPORT FOR PROPOSED KITUSURU FALLS RESIDENCE ON L .R NO. KABETE /KIBICHIKO / 3045 IN WANGIGE , KIAMBU COUNTY.

DATE: 5th May 2022

VENUE: PROPOSED PROJECT SITE

NATURE OF MEETING: PUBLIC PARTICIPATION

NO.	Name	Designation	Location/village	Telephone	Signature
1)	Robert M. Njuguna	Asst Chief Ruaka	Wangige	0703328255	
2)	Faith W. Ngugi	Ass. Chief Kibichiku	Wangige	0720418962	
3)	John M. Mwaura	Lead Expert	NEMA	[illegible]	
4)	Agnes Wanjiru Ngugi	Jirani	Kibichiku	0727849252	
5)	James K. Kungu	Community Policing	Kibichiku	0723667951	
6)	Serah W. Kamau	Jirani	Kibichiku	0712011529	
7)	Simon Mbugua Kimani	Kinsfolk Ltd.	"	0722835908	
8)	George N. Mbugua	Community Policing	Kibichiku	0113243107	
9)	George Gitungo Kungu	Neighbor	Kibichiku	[illegible]	
10)	George Muigai Gitungo	Neighbour	Kibichiku	0729170866	
11)	Rose Wambui Gitungo	Neighbour	Kibichiku	0725140102	
12)	Lucy Wambui Gitungo	Neighbour	Kibichiku	0722390986	
13)	David Gitau Hiram	Neighbour	Kibichiku	0704096936	
14)	Henry Mwaura Hiram	Chairman (Elders)	Kibichiku	0720296221	
15)	Moses G. Kariuki	Community Policing	Kibichiku	0721220882	
16)	John Mjaga Ngigi	Neighbour	Kibichiku	0715360584	
17)	Godfrey Muchugia Ngugi	Neighbour	Kibichiku	0724432703	
18)	George Kanja Gitungo	Neighbour	Kibichiku	0733750090	
19)	Charles Gitungo Kamau	Neighbour	Kibichiku	0722992239	
20)	Stephen Ngegi Kemiva	Neighbour	Kibichiku	0723507566	

ASST CHIEF KIBICHIKU
Date... 05/05/22
Sign...

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY REPORT FOR PROPOSED KITUSURU FALLS RESIDENCE ON L .R NO. KABETE /KIBICHIKO / 3045 IN WANGIGE , KIAMBU COUNTY.

DATE: ……………………………………………………..

VENUE: ……………………………………………………..

NATURE OF MEETING: ………………………………….

NO.	Name	Designation	Location/village	Telephone	Signature
1)	Willie Njoroge Mbugua	Farmer	Kibichiku	0720798243	[signature]
2)	James Kariga Kinyanjui	Farmer	Kibichiku	0712606096	[signature]
3)	Mmadi Japheth	Ass Sociologist		0726381347	[signature]
4)					
5)					
6)					
7)					
8)					
9)					
10)					
11)					
12)					
13)					
14)					
15)					
16)					
17)					
18)					
19)					
20)					

ASST CHIEF KIBICHIKU
Date... 05/05/22
Sign...

Appendix VIII: Public consultation minutes and questionnaires

MINUTES OF CONSULTATIONS FOR THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) STUDY REPORT FOR PROPOSED KITUSURU FALLS RESIDENCE ON L .R NO. KABETE /KIBICHIKO / 3045 IN WANGIGE , KIAMBU COUNTY.

SUBCOUNTY: KABETE SUB-COUNTY	Date: 5TH MAY 2022
SUBLOCATION: KIBICHIKU	Time:
VENUE: PROPOSED SITE	

AGENDA

1. Opening Remarks/Introduction
2. Remarks by the consultant
3. Concerns/Issues from participants
4. Responses given by consultant
5. Adjournment

Item No	Description	Action by
Min 1/22	**Opening Remarks/Introduction** The meeting was called to order by the Assistant Chief Kibichiku Sub-location Madam Faith Ngugi. After a word of prayer, she first thanked the community members for respecting the call and attending the meeting. The Ass. Chief then gave the community members and neighbors the opportunity to introduce themselves. She then gave the consultants to introduce themselves.	

1

Min 2/22	Remarks by Consultant	Action By
	The environmentalist stated that the project is a proposed construction of a residencial house. He emphasized that the environmental Management and Coordination Act Cap 387 requires a proponent with a project with such magnitude to carry out a public consultation in order to seek the views of the potentially affected persons. He urged those in attendance to raise any issues/concerns on the project. The meeting is vital and will form the basis of the proponent getting a NEMA license and doing the actual implementation. He further stated that the project is in line with the Environmental legislations. All the social issues will be taken into considerations. He also added that the development comprised of a real state development. The consultant later introduced the proponent who gave a brief about the project and what it entails. The project will comprise of 240 units with a coffee shop, chemist, barbershop and a school. All the amenities will be integrated in the project. The units will be divided into 1-Bedroom, 2 bedrooms and 3 bedrooms on 6 units and every unit will be on 10 floors.	

3

Min 3/22	**Concerns/Issues from participants**	**Action By**
	How will waste be mangged at the site considering there is a river just next to the proposed site. I hope the wastes whether solid or liquid will not released to our River.	Henry Nwaura (Men Association)
	How will the community benefit from the proposed project.	
	How will sewage and waste be managed at the proposed facility.	George Gitonga
	Will there be machines that will cause vibrations and noise ~~that~~ used at the site?	George Ngugi
	The project is big and its ~~should~~ proponent should consider integrating security lights around the surrounding areas.	James Kanga.
	Will there be development/upgrading of the small access road. Will the road be upgraded to fit the new traffic needs?	Muigai Githongo.
	How high (how many floor will the project have) will the project be. 2 floor?	
	Will the project provide the community with employment?	George Ngugi
	The neighbours who own hardwares to be given priority to supply materials to be used during construction of the proposed project.	Charles Kamau.

4

	Once the proposed project has been implemented, and construction has begun, the area will be very busy thus I recommend bumps to be installed and various road signs to reduce / prevent occurence of accidents.	Moses Gitonga
	Will the height of the development affect network? (Safaricom)	Loise Kambui.
	Business opportunities and stalls at the proposed residence (From the design) to be given to the residents as first priority	George Gitonga.
	Priority in matters to employment to be given to the locals (Designated as number of Boks)	James Kamau
	The proponent is extracting water from the River. Are there guidelines on this because the locals depends on the river for domestic water use.	
	How will storm water and drainage be handled? The proposed project will have a major impact on one of the nearest homestead because of the height of the houses.	

5

Min 4/22	Responses given by the consultant	Action By
	- The proponent will design a biodigester to handle and recycle waste water. - NEMA will monitor the parameters of the water from the River so that if aligns to the recommended limits. The water will be analyzed by a NEMA authorised laboratory. - WRA has given the proponent a license to abstract water from the River and they will follow the guidelines. - The project will source skilled and unskilled manpower from the locals. Only experts will be sourced outside. - The road will be upgraded to cabro to connect to the tarmac road (Ngecha Road). The proponent will work with Ministry of Roads. - Storm water will be drained to the river. - Street lighting will be integrated. - The project will have 10 floors and a total of 240 units. - Excavations will be done with machines that are well maintained. The machineries will cause vibrations. - Speed limits/ Road signs will be recommended to the proponent.	

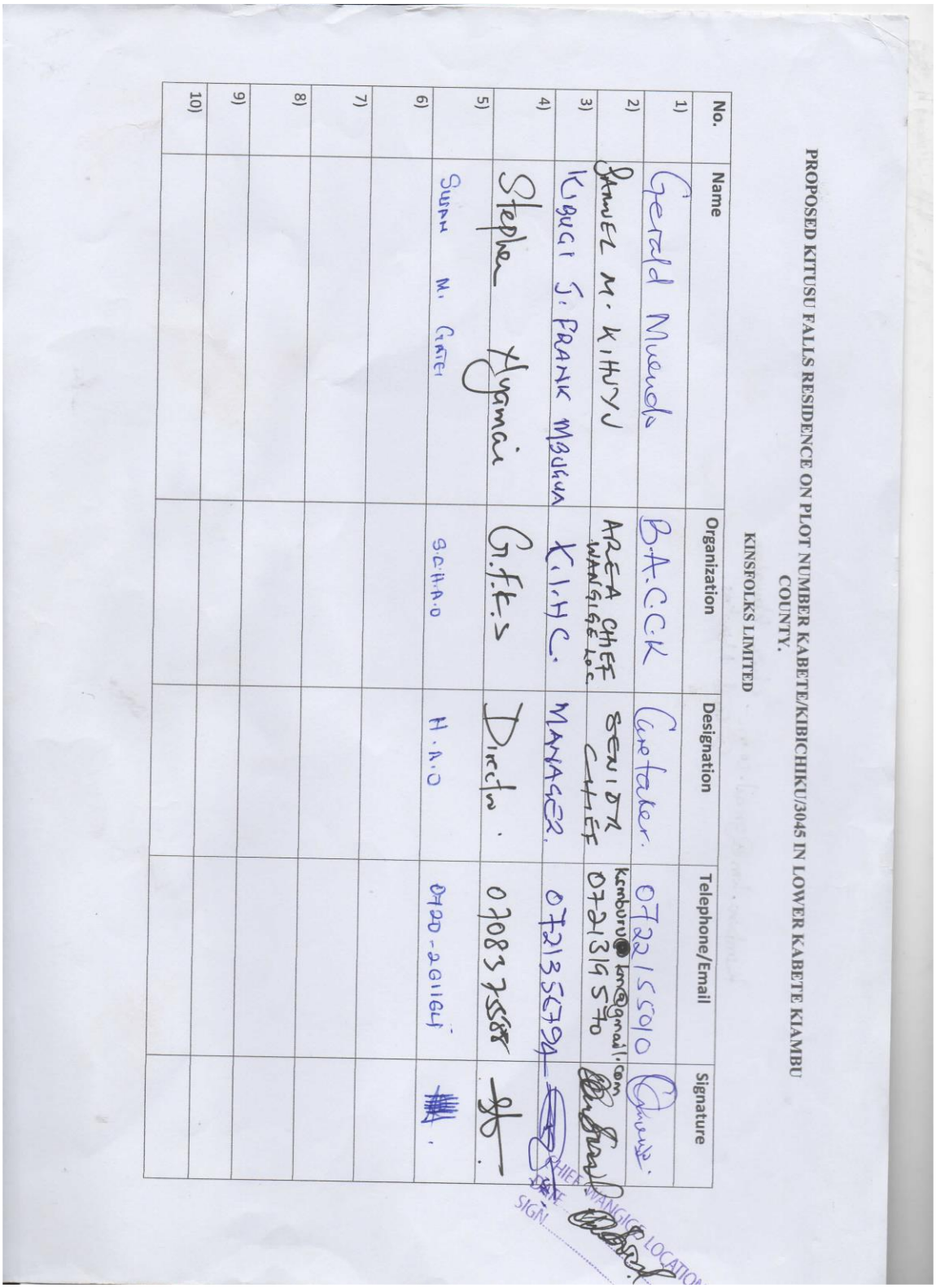
6

Min 5/22	Adjournment	Action By
	The consultant and the Assistant chief first thanked the community members for attending and giving their valuable feedback. With no other business to discuss, the meeting was adjourned.	

Minutes Prepared by:	Mundi Japheth	**Date** 05/05/21
Position	Ass. Environmentalist	
Signature	[signature]	
Minutes Confirmed by	Faith Ngugi	**Date** 05/05/21
Position	Assistant Chief	
Signature	ASST CHIEF KIBICHIKU Date Ngugi Sign	

7

Appendix IX: Signing sheet for the key Informant interviewed



PROPOSED KITUSU FALLS RESIDENCE ON PLOT NUMBER KABETE/KIBICHIKU/3045 IN LOWER KABETE KIAMBU COUNTY.

KINSFOLKS LIMITED

No.	Name	Organization	Designation	Telephone/Email	Signature
1)	Gerald Mueni	B.A.C.C.K	Caretaker.	0722155010	
2)	Samuel M. Kihiu	AREA CHIEF WANGIGE LOC.	SENIOR CHIEF	kimburu@kmcgmail.com 0721319570	
3)	Kuguci J. Frank Mbuku	K.I.H.C.	MANAGER.	0721356794	
4)	Stephen Nyamai	G.F.K.S	Director.	0708375588	
5)	Susan M. Gatei	SCHOOL	H.O.D	0720-201164	
6)					
7)					
8)					
9)					
10)					

CHIEF WANGIGE LOCATION
SIGN

Appendix X: Water Analysis results

Lab Works East Africa LTD
P.O.Box 6459-00100
Shelter Afrique Centre, 3rd Floor Wing
Upperhill Nairobi Kenya
Phone: +254(0)2724481
Email: technical@labworksea.com

Client : Kinsfolk Limited
Phone: 0729924873
P.O Box 7538-00100
Town: Nairobi
Country: Kenya

LABORATORY TEST REPORT

Date Received : 10/05/2022 **Batch No** : 22/068
Date Started : 11/05/2022 **Sample Ref:** LW1890
Date Completed : 13/05/2022 **Sampled By:** Client
External Sample ID : Natural Water **Report Date:** 18/05/2022

First Schedule Water Analysis

PARAMETER	Method	Results	Guide L & H			Ref. Std Limits (Max)
			Low	Opt.	High	
pH	ISO 10523	7.789				6.5 - 8.5
Total Suspended Solids (TSS), mg/L	APHA 2540	11				30
Total Dissolved Solids (TDS), mg/L	APHA 2540 C	134.70				1200
Nitrates, mg/L	ISO 7890	3				10
Ammonium Nitrogen, mg/L	ISO 11732	0.40				0.5
Nitrites, mg/L	ISO 6777	0.03				3
Flouride, mg/L	APHA 4500F	0.69				1.5
E.coli cfu per 100ml	ISO 9308-1	Nil				Nil
Phenols, mg/L	APHA 5530	0.15				Nil
Arsenic, mg/L	ISO 8288	<0.001				0.01
Cadmium, mg/L	ISO 8288	<0.001				0.01
Lead, mg/L	ISO 8288	<0.001				0.05
Selenium, mg/L	ISO 17379	<0.001				0.01
Zinc, mg/L	ISO 8288	<0.01				1.5
Permanganate Value (pV), mg/L	ISO 8467	Nil				1.0
Alkyl benzyl Sulphonates, mg/L	ASTM D4711	Nil				0.5
Copper, mg/L	ISO 8288	0.18				0.05
Total coliform, cfu/100ml	ISO 9308-1	20				X^2
Chloroform	LWTP 037	Nil				X^2
Free Residual chlorine	LWTP 012	0.01				X^2

Notes:
Standard values quoted from Environmental Management & Coordination (Water Quality) Regulations 2006, Legal Notice No. 120, First Schedule
< 0.01 means less than detection limit
Results provided in this test report apply to the sample as received by the laboratory.
Measurement uncertainties can only be availed upon request.
ISO - International Organization for Standardization APHA- American Public Health Association
ASTM- American standard test methods
AOAC- Association of Official Analytical Chemists
LWTM - Lab Works Procedure adopted from ISO and APHA Methods

Authorized signatory: Jacob Kipkoech
Technical signatory: Judy Kiarie
Technical signatory: David Muiruri

Page 1 of 1

Lab Works E.A. Ltd is an ISO/IEC 17025:2017 accredited Laboratory by Kenya Accreditation Service.