

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY REPORT FOR THE PROPOSED
DEGAZZETTEMET OF NGAI NDETHYA SETTLEMENT SCHEME IN KIBWEZI EAST SUB-COUNTY,
MAKUENI COUNTY**



PROJECT PROPONENT

REPUBLIC OF KENYA



GOVERNMENT OF MAKUENI COUNTY

Department of Lands, Mining, Housing, Physical
Planning and Urban Development
P.O. Box 78-90300, MAKUENI
Tel: +254 700 346 625
Email: lands@makueni.go.ke
Website: www.makueni.go.ke

ENVIRONMENTAL CONSULTANT



GLOBAL HOPE CONSULTANTS

P.O Box 441-90300,

MAKUENI, KENYA

TEL: 0725 927 557

EMAIL: ghopeconsult.fm16@gmail.com

FIRM NEMA Reg. No. 8662

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PROPOSED DEGAZZETTEMET OF NGAI NDETHYA SETTLEMENT SCHEME IN
KIBWEZI EAST SUB-COUNTY, MAKUENI COUNTY
SUBMISSION OF DOCUMENTATION**

DECLARATION BY THE ENVIRONMENTAL CONSULTANT

We, **Ms. Faith Moses** and **Dr. Matheaus K. Kauti** of GLOBAL HOPE CONSULTANTS submit this Environmental Impact Assessment (EIA) project report for **THE PROPOSED DEGAZZETTEMET OF NGAI NDETHYA SETTLEMENT SCHEME IN KIBWEZI EAST SUB-COUNTY, MAKUENI COUNTY, DEPARTMENT OF LANDS, MINING, HOUSING, PHYSICAL PLANNING AND URBAN DEVELOPMENT, MAKUENI COUNTY**. The Environmental Impact Assessment Project has been carried out according to the Environmental Management and Coordination Act, 1999 and Environmental (Impact Assessment and Audit) Regulations, 2003. To our knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed infrastructural development.

Signed at MAKUENI on this 23rd day of April, 2019

Signature: 

Ms. Faith Moses, MSc.

PhD

Signature: 

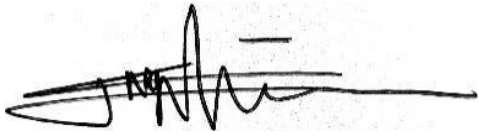
Dr. Matheaus K. Kauti,

Designation: EIA/Audit Lead Experts Reg. Nos. 8227 & 7064

DECLARATION BY THE PROPONENT

I **ALEX NTHIWA** on behalf of **Makueni County Government**, submit this Environmental Impact Assessment (EIA) project report for **THE PROPOSED DEGAZZETTEMET OF NGAI NDETHYA SETTLEMENT SCHEME IN KIBWEZI EAST SUB-COUNTY, MAKUENI COUNTY, DEPARTMENT OF LANDS, MINING, HOUSING, PHYSICAL PLANNING AND URBAN DEVELOPMENT, MAKUENI COUNTY**. The Environmental Impact Assessment Project has been carried out according to the Environmental Management and Coordination Act, 1999 and Environmental (Impact Assessment and Audit) Regulations, 2003. To my knowledge, all information contained in this report is accurate and a truthful representation of all findings as relating to the proposed infrastructural development.

Signed at MAKUENI on this 24TH day of April, 2019

Signature: 

Alex Nthiwa

Designation: Chief Officer

Department of Lands, Mining, Housing, Physical Planning And Urban Development, Makueni County.

LIST OF PLANNING AND PARTICIPATING EXPERTS

Name	Specialization and Qualification
1. Ms. Faith Moses, MSc	Team Leader & EIA Lead Expert (Reg. No. 8227) M.Sc. Environmental Management
2. Dr. Matheaus K. Kauti, PhD	EIA Lead Expert (Reg. No.7345) PhD in Environmental Studies
3. Dr. Patrick Kisangau, PhD	EIA Lead Expert (Reg. No. 7786) PhD in Plant Ecology
4. Ms. Mercy Cheruto	MSc. Environmental Management
5. Mr. Raphael Kieti, MSc	Socio-Economist M.Sc. Environmental Management

ACRONYMS

CLPs	Consents, Licenses and Permits
EA	Environmental Audit
EAC	East African Community
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Co-ordination Act
EMP	Environmental Management/Monitoring Plan
KM ²	Square Kilometres
KWS	Kenya Wildlife Services
M ²	Metre Squared
NEAP	National Environment Action Plan
NEC	National Environmental Council
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
PM	Particulate Matter
PPE	Personal Protective Equipment
PPG (E)	Personal Protective Gear (Equipment)
PPM	Parts Per Million
PVC	Polyvinylchloride
SWM	Solid Waste Management
TOR	Terms of Reference
VAT	Value Added Tax
VOC	Volatile Organic Compounds
WRMA	Water Resources Management Authority

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EXECUTIVE SUMMARY

Ngai Ndethya settlement scheme is located in Kibwezi East Sub-county, Makueni County. The Scheme was established in the year 1992 on an approximately 21,200 hectares belonging to Ngai Ndethya Game Reserve which is managed by Kenya Wildlife Services. The scheme was established after negotiations to transfer the land to the Settlement Fund Trustees. However, the transfer of the scheme was not effected since the land had to be excised from the Ngai Ndethya Game Reserve. Consequently, the component settlement schemes which are fully settled cannot be registered for issuance of Title Deeds to the beneficiaries.

The component schemes are Ngai Ndethya, Ngiluni and Mbeetwani settlement schemes. The scheme borders ecologically sensitive areas such as Ngai Ndethya Game Reserve, Mtito River, Kambu River and Kwa Kalusi River. The scheme has several infrastructural facilities such as schools, markets, hospitals and earth dams.

For the excision of the scheme from the game reserve to be effected, the Cabinet Secretary Ministry of Environment and Natural Resources required an authorization (Letter annex 1) by the County Government of Makueni before signing the draft cabinet memorandum. The Ministry also advised that, the County should also do that upon consultation with the National Land Commission and Kenya Wildlife Service and also be subjected to Environmental Impact Assessment.

To fulfil the above requirements, a stakeholders meeting was held on 22nd January 2018 convened by H. E the Governor of Makueni, Prof. Kivutha Kibwana, the National Land Commission - Commissioner Dr. Rose Musyoka, representatives of the Kenya Wildlife Service and Ministry of Land Officials. (Report attached). The meeting resolved the following:

1. No objection on the excision of the land to facilitate the issuance of title deeds to the beneficiaries in the scheme was granted.
2. Environmental Impact Assessment to be carried out by the relevant County Department dealing with environmental matters.
3. After the excision of the schemes from the game reserve, the Kenya Wildlife Service to fence off the park to stop human wildlife conflict.

The stakeholders present were categorized as follows:

1. The County Government of Makueni
2. The National Land Commission
3. The Ministry of Lands and Physical Planning

4. Kenya Wildlife Service
5. Members of public
 1. Members of Ngai Ndethya settlement scheme
 2. Members of Ngiluni settlement scheme
 3. Members of Mbeetwani settlement scheme
 4. Other people with land interest in the area.

To aid in the above, The Department of Lands, Mining, Physical Planning and Urban Development is planning on de-gazettement and excision of the land from Ngai Ndethya Game Reserve with the approval of Cabinet. This was after the Cabinet Secretary in the Ministry of Environment and Natural Resources requested the County Government of Makueni to undertake an Environmental and Social Impact Assessment before a Cabinet Memo on degazettement of Ngai Ndethya is approved.

Therefore, in order to comply with the request and also ensure the sustainability of the exercise, the Department of Lands, Mining, Physical Planning and Urban Development and the Department of Water, Environment, Natural Resources and Climate Change is planning to carry out an Environmental and Social Impact Assessment and prepare an Environmental Management & Monitoring Plan (ESMP) in line with the Environmental Management and Coordination Act (EMCA 1999).

An Environmental Impact and Social Assessment will predict and assess the potential environmental and social impacts of de-gazettement of Ngai Ndethya, evaluating alternatives and designing appropriate mitigation, management and monitoring measures.

Since the inception of the Environmental Management and Coordination Act (EMCA) 1999, it has now become a legal requirement for all projects listed in the second schedule to undertake Environmental Impact Assessment (EIA). Environmental concerns now need to be part of the planning and development process and not an afterthought, it is therefore advisable to avoid land use conflicts with the surrounding area. To avoid unnecessary conflicts that retard development in the country, the proponent undertook this Environmental Impact Assessment (EIA) and incorporated environmental concerns as advised by the Authority.

Environmental Impact Assessment is a tool for environmental conservation and has been identified as a key component in new project implementation. According to section 58 of the Environmental Management and Coordination Act (EMCA) No.8 of 1999 second schedule 9 (1), and Environmental (Impact Assessment and Audit) regulation, 2003, new projects must undergo Environmental Impact Assessment. The Report of the same must be

submitted to National Environment Authority (NEMA) for approval and issuance of relevant certificates. This was necessary as many forms of developmental activities cause damage to the environment and hence the greatest challenge today is to maintain sustainable development without interfering with the environment.

Scope, Objective and Criteria of the Environmental Impact Assessment (EIA)

Licensed Environmental Firm of Experts (**Global Hope Consultants Ltd**) in Environmental Impact Assessment and Auditing were appointed as Consultants to conduct the Environmental Impact Assessment of the proposed Degazettement of Ngai Ndethya settlement scheme project. The major objective of this EIA is to evaluate the effects/impacts of proposed project in relation to the environment i.e. physical, biological, and social-economic environments. It aims at assessing and prediction of all the positive and negative impacts of the project on the environment and recommends measures to reinforce the positive and reduce the negative impacts of the project.

The scope of the assessment covered the implementation/operation and decommissioning proposed project. The proposed project will involve Degazettement of Ngai Ndethya Settlement scheme which is currently gazetted as a National Reserve area, to enable the locals be issued with title deeds for settlement.

The output of the study was the production of an Environmental Impact Assessment study report for submission to NEMA for the purposes of seeking an EIA license. The consultant on behalf of the proponent conducted the EIA by incorporating the following Terms of Reference (TOR):

- A description of the location of the proposed Degazettement of Ngai Ndethya project
- A concise description of the National Environmental Legislative and Regulatory Framework, baseline information, and any other relevant information related to the project.
- The objectives of the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- Analysis of alternatives including project site
- An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.

- An economic and social analysis of the project.
- Such other matters as the Authority may require.

Methodology Outline

Since the scheme borders ecological sensitive areas such as Ngai ndethya Game Reserve, Mtito River, Kambu River and Kwa Kalusi River. The scheme is divided into three; Mbetwani, Ngai ndethya and Ngiluni. The scheme has several infrastructures such as schools, markets, hospitals and dams, a comprehensive environmental study report is seen to be adequate. The general steps followed during the assessment were as follows:

1. Environmental screening, in which the project was identified as among those requiring environmental impact assessment under schedule 2 of EMCA, 1999
2. Environmental scoping that provided the key environmental issues
3. Desktop studies and interviews
4. Physical inspection of the site and surrounding areas
5. EIA Public participation via the use of public barazas and questionnaires
6. Reporting.

Project Description/Scope

The consultant, in cooperation with the Makueni County Government, local administration, beneficiary community, conducted the study in the three component schemes of Ngai Ndethya settlement scheme (Ngai Ndethya, Mbetwani & Ngiluni) in Kibwezi East and produce an ESIA study report for the De-gazettement. This will be funded by the County Government of Makueni.

Impacts and Mitigation Measures

There are both positive and negative impacts associated with the proposed project. These are identified according to phases: Operational Phase and Decommissioning Phase. In general, the following positive impacts are associated with the proposed project;

- Peaceful coexistence with communities and wildlife
- Increase in human settlement land availability.
- Optimal use of land.
- Improved security in the project area.
- Improved infrastructure such as roads and other services within the area.
- Enhanced livelihoods options for the local residents
- Enhanced environmental conservation
- Minimised human/wildlife conflicts

- Business investment opportunities
- Aesthetics as a result of landscaping and restoration of the site

The negative Impacts associated with the proposed project are:

- Loss of biodiversity
- Loss of part of wildlife sanctuary
- Environmental degradation and deforestation
- Hydrology and water quality degradation.
- Solid Waste Management and Management of household wastes.
- Soil erosion, sedimentation and increased runoff due to human activities
- Use of an otherwise undeveloped natural land resulting in a changed landscapes.
- Increased Population without commensurate services and facilities.
- Increased Pressure on Infrastructure and natural sources at large

In order to alleviate the negative impacts associated with the project the proponents shall take several measures, in order to alleviate the impact of un proportionate population increase, thus creating pressure on existing facilities; adequate social service delivery will be considered at all stages of the project development to counter this anomaly. Social services with adequate housing, sanitation, provision of social services during project implementation shall be adhered to.

Table 1: Summary of Impacts and Mitigation Measures

Possible Impacts	Mitigation measures
Project associated conflicts e.g. Disputes with neighbourhoods	<ul style="list-style-type: none"> • Community support mobilization and sensitization through consultative forums, public meetings & questionnaire methods • Draft, finalize, and implement land acquisition, compensation and resettlement plan for affected households, businesses, public utilities, and other groupings using participatory approach • Sufficient planning for adequate resources required i.e. financial, personnel and equipment • Land transfer agreements should be formalized before the project start as per the laws of the land • Restrict project within the corridor set as much as possible.
Impacts on Flora, Fauna, Avifauna, Habitat Loss Destruction, disturbance and Displacement	<ul style="list-style-type: none"> • Ensure proper demarcation and delineation of the project area to be set for human settlement and the National park. • Introduction of vegetation (trees, shrubs and grass) on open spaces and their maintenance • Create awareness on importance of bio-diversity amongst the local residents • Design and implement an appropriate Reforestation/Afforestation,

	landscaping programme to help in re-vegetation of the project area after settlement.
Human-Wildlife Conflicts	<ul style="list-style-type: none"> • The best approach is represented by changing attitudes to wildlife through education and by ensuring that affected communities and individuals are active participants in, and enjoy tangible benefits from, wildlife management. • Completely removing either the people or the animals, physically separating the two by the use of barriers, managing by a variety of means the numbers of animals to reduce the risk of conflict, and employing a variety of scaring and repelling tactics. • Managing the size of the population to reduce the risk of human-wildlife conflict arising. These include selectively killing animals as well as controlling their reproduction. • Exclusion of wild animals by use of physical barriers, which are properly designed, constructed and maintained, fences.
Increased Storm Water, runoff and soil erosion	<ul style="list-style-type: none"> • A storm water management plan that minimizes impervious area infiltration by use of recharge areas and use of detention and/or retention with graduated outlet control structure will be designed. • Apply soil erosion control measures such as terracing of farm land within the project site to reduce run-off velocity and increase infiltration of storm water into the soil. • Implement silt control measures such as silt fences and silt traps. • Excavations to remain open for very short time before placement of fill to minimize potential for entry of surface water runoff into excavations.
Poor health and sanitation	<ul style="list-style-type: none"> • Create awareness prevention on HIV/AIDS and other related diseases • Avail health care services to the local community • Provide adequate drinking water to the local community
Impacts on local infrastructure, services and natural resources	<ul style="list-style-type: none"> • All roads being used at the project site should be well maintained, and left in as good state, or better than their current state. • Involve the community during road upgrades. • Natural Resources within the project site should be conserved

Conclusion

Considering the immense positive socio-economic and environmental benefits to accrue as a result of the proposed degazettement of Ngai Ndethya Project and the EIA study having found no major negative impacts to arise from the development, it is our recommendation that the project be allowed to proceed on the understanding that the proponent will adhere to the mitigation measures recommended herein and will further still implement the proposed Environmental Management Plan (EMP) to the letter.

1. INTRODUCTION

1.1 Background and Rationale for an Environmental Impact Assessment

Ngai Ndethya settlement scheme is in Kibwezi East Sub County. The scheme borders ecological sensitive areas such as Ngai Ndethya Game Reserve, Mtito River, Kambu River and Kwa Kalusi River. The scheme is divided into three; Mbetwani, Ngai Ndethya and Ngiluni. The scheme has several infrastructures such as schools, markets, hospitals and dams. The Scheme was established in the year 1992 on an approximately 21,200 ha belonging to Ngai Ndethya Game Reserve which is managed by Kenya Wildlife Services. This was after negotiations to transfer the land to the Settlement Fund Trustees. Ngai Ndethya game reserve will surrender 21,200 hectares for Ngai Ndethya, Ngiluni and Mbetwani settlement schemes.

However, the transfer was not affected. Consequently, the component settlement schemes which are fully settled cannot be registered for issuance of Title Deeds to the beneficiaries. To aid in the above, The Department of Lands, Mining, Physical Planning and Urban Development is planning on de-gazettement and excision of the land from Ngai Ndethya Game Reserve with the approval of Cabinet. This was after the Cabinet Secretary in the Ministry of Environment and Natural Resources requested the County Government of Makueni to undertake an Environmental and Social Impact Assessment before a Cabinet Memo on degazettement of Ngai Ndethya is approved.

Therefore, in order to comply with the request and also ensure the sustainability of the exercise, the Department of Lands, Mining, Physical Planning and Urban Development and the Department of Water, Environment, Natural Resources and Climate Change was mandated to carry out an Environmental and Social Impact Assessment and prepare an Environmental Management & Monitoring Plan (ESMP) in line with the Environmental Management and Coordination Act (EMCA 1999).

An Environmental Impact and Social Assessment will predict and assess the potential environmental and social impacts of de-gazettement of Ngai Ndethya, evaluating alternatives and designing appropriate mitigation, management and monitoring measures.

It's against this background that Makueni County Government through the Department of Land, Mining, Physical Planning and Urban Development is seeking the service of a NEMA registered lead expert/Firm of experts (Global Hope Consultants Ltd) to carry out an Environmental and Social Impact Assessment and prepare an Environmental Management & Monitoring Plan (ESMP) in line with the Environmental Management and Coordination Act (EMCA 1999) and the Environmental Impact Assessment & Audit Regulations (2003) and the

subsidiary legislations there under including the Land Act (2012), Wildlife Conservation and Management Act (2013), the Water Act (2007) and Occupational Safety and Health Act (OSHA 2007).

These are the Terms of reference for conducting Environmental and Social Impact Assessment for Since the inception of the Environmental Management and Coordination Act (EMCA) 1999, it has now become a legal requirement for such projects to undertake an Environmental Impact Assessment (EIA). Environmental concerns now need to be part of the planning and development process and not an afterthought. To avoid unnecessary conflicts that retard development in the country, the proponent undertook this Environmental Impact Assessment (EIA) and incorporated environmental concerns as advised by the Authority.

1.2 Scope, Objective and Criteria of the Environmental Impact Assessment (EIA)

1.2.1 Scope

The Kenya Government policy on all new projects, programmes or activities requires that an EIA be carried out at the planning stages of the proposed undertaking to ensure that significant impacts on the environment are taken into consideration during the design, construction, operation and decommissioning of the facility. The scope of this Environmental Impact Assessment, therefore, covered:

- The baseline environmental conditions of the area,
- Description of the proposed Degazetement of Ngai Ndethya settlement scheme project,
- Provisions of the relevant environmental laws,
- Identification and discussion of any adverse impacts to the environment anticipated from the proposed project by incorporating public participation,
- Appropriate mitigation measures,
- Provision of an environmental management plan outline.

1.2.2 Terms of Reference (TOR) for the EIA Process

Licensed Environmental Firm of Experts in Environmental Impact Assessment and Auditing were appointed as Consultants to conduct the Environmental Impact Assessment of the proposed degazettement project. The major objective of this EIA report is to evaluate the effects/impacts of proposed project in relation to the environment i.e. physical, biological, and social-economic environments. It aims at assessing and prediction of all the positive and negative impacts of the project on the environment and recommends measures to reinforce the positive and reduce the negative impacts of the project.

The scope of the assessment covered the operation/implementation and decommissioning proposed project. The proposed project will involve excision of the Ngai Ndethya Settlement scheme from its current status registered under Ngai Ndethya Game Reserve. Consequently, the component settlement schemes which are fully settled will be registered under human settlements for issuance of Title Deeds to the beneficiaries.

The Environmental Impact Assessment included the necessary specialist studies to determine the environmental impacts relating to the biophysical, environmental, health and safety and socio-economic aspects and to determine the issues of concerns from the relevant authorities and interested and/or affected parties. The appropriate measures to ensure co-existence of the proposed project with other social and economic activities in the area are provided as part of Environmental Management Action Plan.

The main objective of the assignment was to assist the proponent to prepare an ESIA Study report of the proposed degazettement of Ngai Ndethya settlement scheme project, to ensure the proposed project takes into consideration appropriate measures to mitigate any adverse impacts to the environment. The study identified existing and potential environmental impacts and possible concerns that interested and/or affected parties have with the development, as well as the associated prevention and mitigation measures for the negative impacts as stipulated in the Environmental Management Plan (EMP) proposed.

The consultant on behalf of the proponent conducted the study by incorporating the following terms of reference: -

- A description of the location of the proposed degazettement of Ngai Ndethya project
- A concise description of the National Environmental Legislative and Regulatory Framework, baseline information, and any other relevant information related to the project.
- The objectives of the project.
- A description of the potentially affected environment.
- The environmental effects of the project including the social and cultural effects and the direct, indirect, cumulative, irreversible, short-term and long-term effects anticipated.
- Analysis of alternatives including project site
- An environmental management plan proposing the measures for eliminating, minimizing or mitigating adverse impacts on the environment, including the cost, timeframe and responsibility to implement the measures.
- An economic and social analysis of the project.
- Such other matters as the Authority may require.

1.2.3 Data collection procedures

The Consultant undertook environmental screening and scoping to ensure all areas of concern were highlighted. The data collection was carried out through questionnaires/standard interview schedules, use of checklists, observations and photography, site visits and desktop environmental studies, where necessary in the manner specified in Part V (section 31-41) of the Environmental (Impact Assessment and Audit) Regulations, 2003.

1.2.4 Reporting and documentation

The Environmental Impacts Assessment Project Report developed from the findings was compiled in accordance with the guidelines issued by NEMA for such works and was prepared and submitted by the proponent for consideration and approval. The Consultant ensured constant briefing of the client during the exercise. Description plans and sketches showing various activities are part of the Appendices.

1.2.5 Responsibilities and undertaking

The Consultant met all logistical costs relating to the assignment, including those of production of the report and any other relevant material. The consultant arranged for his own transport and travels during the exercise. On the site of the proposed project, the proponent provided contact persons to provide information required by the consultant. The proponent also provided site plan(s) showing roads, service lines and the actual sizes of the site and site history. The output from the consultants includes the following:-

- An Environmental Impact Assessment Study report comprising of an executive summary, study approach, baseline conditions, anticipated impacts and proposed mitigation measures,
- An Environmental Management Plan which also forms part of the report recommendations.

1.2.6 Methodology outline

Since the scheme borders ecological sensitive areas such as Ngai ndethya Game Reserve, Mito River, Kambu River and Kwa Kalusi River. The scheme is divided into three; Mbetwani, Ngai ndethya and Ngiluni. The scheme has several infrastructures such as schools, markets, hospitals and dams, a comprehensive environmental study report is seen to be adequate. The general steps followed during the assessment were as follows:

1. Environmental screening, in which the project was identified as among those requiring environmental impact assessment under schedule 2 of EMCA, 1999

2. Environmental scoping that provided the key environmental issues
3. Desktop studies and interviews
4. Physical inspection of the site and surrounding areas
5. EIA Public participation via the use of public barazas and questionnaires
6. Reporting.

1.2.6.1 Environmental screening

This step was applied to determine whether an environmental impact assessment was required and what level of assessment was necessary. This was done in reference to requirements of the EMCA, 1999, and specifically the second schedule. Issues considered included the physical location, sensitive issues, and nature of anticipated impacts.

1.2.6.2 Environmental scoping

The scoping process helped narrow down onto the most critical issues requiring attention during the assessment. Environmental issues were categorized into physical, natural/ecological and social, economic and cultural aspects.

1.2.6.3 Desktop studies

This included documentary review of the nature of the proposed activities, project documents, designs policy and legislative framework as well as the environmental setting of the area among others. It also included discussions with the relevant County Government key stakeholders, KWS officials and well as interviews with neighbours.

1.2.6.4 Site assessment and public participation

Field visits were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts as well as collecting data for baseline information. To ensure adequate public participation in the EIA process, questionnaires were administered to the sites neighbours and the information gathered was subsequently synthesised and incorporated into the EIA project report.

1.2.6.5 Reporting

In addition to constant briefing of the client, this Environmental Impact Assessment project report was prepared. The contents were presented for submission to NEMA as required by law.

2. DESCRIPTION OF THE PROJECT

2.1 Introduction

Ngai Ndethya settlement scheme is located in Kibwezi East Sub-county, Makueni County. The Scheme was established in the year 1992 on an approximately 21,200 hectares belonging to Ngai Ndethya Game Reserve which is managed by Kenya Wildlife Services. The scheme was established after negotiations to transfer the land to the Settlement Fund Trustees. However the transfer of the scheme was not effected since the land had to be excised from the Ngai Ndethya Game Reserve. Consequently, the component settlement schemes which are fully settled cannot be registered for issuance of Title Deeds to the beneficiaries.

The component schemes are Ngai Ndethya, Ngiluni and Mbeetwani settlement schemes. The scheme borders ecologically sensitive areas such as Ngai Ndethya Game Reserve, Mtito River, Kambu River and Kwa Kalusi River. The scheme has several infrastructures such as schools, markets, hospitals and dams.

For the excision of the scheme from the game reserve to be effected, the Cabinet Secretary Ministry of Environment and Natural Resources required an authorization (Letter annex 1) by the County Government of Makueni before signing the draft cabinet memorandum. The Ministry also advised that, the County should also do that upon consultation with the National Land Commission and Kenya Wildlife Service and also be subjected to Environmental Impact Assessment.

To fulfil the above requirements, a stakeholders meeting was held on 22nd January 2018 convened by H. E the Governor of Makueni, Prof. Kivutha Kibwana, the National Land Commission - Commissioner Dr. Rose Musyoka, representatives of the Kenya Wildlife Service and Ministry of Land Officials. The meeting resolved the following (Minutes of the Meeting Annex 2):

1. No objection on the excision of the land to facilitate the issuance of title deeds to the beneficiaries in the scheme was granted.
2. Environmental Impact Assessment to be carried out by the relevant County Department dealing with environmental matters.
3. After the excision of the schemes from the game reserve, the Kenya Wildlife Service to fence off the park to stop human wildlife conflict.

The stakeholders present are categorized as follows:

1. The County Government of Makueni

2. The National Land Commission
3. The Ministry of Lands and Physical Planning
4. Kenya Wildlife Service
5. Members of public (Attendance List of Stakeholders annex 3)
 1. Members of Ngai Ndethya settlement scheme
 2. Members of Ngiluni settlement scheme
 3. Members of Mbeetwani settlement scheme
 4. Other people with land interest in the area.

To aid in the above, The Department of Lands, Mining, Physical Planning and Urban Development is planning on de-gazettement and excision of the land from Ngai Ndethya Game Reserve with the approval of Cabinet. This was after the Cabinet Secretary in the Ministry of Environment and Natural Resources requested the County Government of Makueni to undertake an Environmental and Social Impact Assessment before a Cabinet Memo on degazettement of Ngai Ndethya is approved.

Therefore, in order to comply with the request and also ensure the sustainability of the exercise, the Department of Lands, Mining, Physical Planning and Urban Development and the Department of Water, Environment, Natural Resources and Climate Change is planning to carry out an Environmental and Social Impact Assessment and prepare an Environmental Management & Monitoring Plan (ESMP) in line with the Environmental Management and Coordination Act (EMCA 1999).

An Environmental Impact and Social Assessment will predict and assess the potential environmental and social impacts of de-gazettement of Ngai Ndethya, evaluating alternatives and designing appropriate mitigation, management and monitoring measures.

2.2 Project Description/Scope

The consultant, in cooperation with the Makueni County Government, local administration, beneficiary community, will conduct the study in the three component schemes of Ngai Ndethya settlement scheme (Ngai Ndethya, Mbetwani & Ngiluni) in Kibwezi East and produce an ESIA study report for the de-gazettement. This will be funded by the County Government of Makueni.

2.3 Project Activities

The Environmental Impact Assessment Study activities to be carried out will be as follows;

1. Conduct site visits to all the three divisions.

2. Review of existing information and identification of environmental issues. Review the national environmental legislative and regulatory framework.
3. Selection of the important environmental and social components of the project.
4. Analyze the key environmental issues with special attention to the long-term impacts.
5. Assess the potential impacts of the development.
6. Assess risks and hazards associated with the project's de-gazettement
7. Carry out public consultation in each of the three divisions.
8. Hold a consultative meeting with the key stakeholders.
9. Prepare a comprehensive Environmental and Social Management and Monitoring Plan (ESMP).
10. Prepare and propose mitigation measures of the potential adverse environmental effects of the project.
11. Prepare Residual impact list of those that might not have any remedial measures and identify further steps towards sustainability of the project.

The Project de-gazettement process and project implementation activities to be executed after the NEMA approval and licence:

- Planning
- Cost and budgetary allocation
- Land Surveying
- Beacons and demarcations
- Land allocation of economically viable agricultural settlement land to the beneficiaries
- Issuance of Title deeds to beneficiaries

3. BASELINE INFORMATION

3.1 Project Location Area and its Description

Ngai Ndethya settlement scheme is in Kibwezi East Sub County, Makueni County in the lower South Eastern. Kenya. The county covers 8,034.7 km². It lies in latitude 1° 35' South and longitude 38° 30' East. The county has six sub counties namely Makueni, Mbooni, Kaiti, Kilome, Kibwezi West and Kibwezi East. There are 6 parliamentary constituencies, 30 County assembly wards, 82 locations and 232 sub-locations (GOK, 2013).

The scheme borders ecological sensitive areas such as Ngai Ndethya Game Reserve, Mtito River, Kambu River and Kwa Kalusi River. The scheme is divided into three; Mbetwani, Ngai Ndethya and Ngiluni. The scheme has several infrastructures such as schools, markets, hospitals and dams. The Scheme was established in the year 1992 on an approximately 21,200 ha belonging to Ngai Ndethya Game Reserve which is managed by Kenya Wildlife Services. This was after negotiations to transfer the land to the Settlement Fund Trustees.

3.2 Physical and Agro-Climatic Condition

The topography of the project site is sloppy; gently sloping at 2-3° towards Mtito Andei river. The general elevation is between 744-754m above sea level. The neighbourhood Mtito town, rivers such as Mtito Andei, Kambu and Kamunyuni, hills, escarpments such as Chyulu, Parks such as Tsavo among others form the main relief features within the proposed site. Most of these rivers, hills, parks and escarpments stand prominently as biodiversity hotspots in the predominantly semi-arid zone.

The proposed project is located in an ecosystem representing different agro-ecological zones with various biophysical and socio-economic factors that determine its environmental dynamics. The site is predominantly an agropastoral area with the majority of inhabitants being the Akamba community.

The climate of the proposed project site and the larger Mtito Andei is influenced by altitude and physical features, i.e., lakes, swamps, escarpments, hills and mountains in the neighbourhood. A bimodal rainfall pattern experienced in the site is influenced by altitude. The mean annual rainfall in Mtito Andei and its neighbourhood districts ranges from 300 to 800 mmⁱ. However, heavy rains occur around Chyulu Hills, which rises as an isolated iceberg away from the project site, receiving 1,250 mm of rainfall per annum. The rainfall for the two wet seasons indicates that most areas receive 50 per cent of the annual rainfall during the March-May period and 30 per cent during the October-December period (GoK, 2009). The short rains (October-

December) is more reliable compared to the long rains (March-May). The prevailing climate in the area is suitable for ranching activities and rain-fed agriculture.

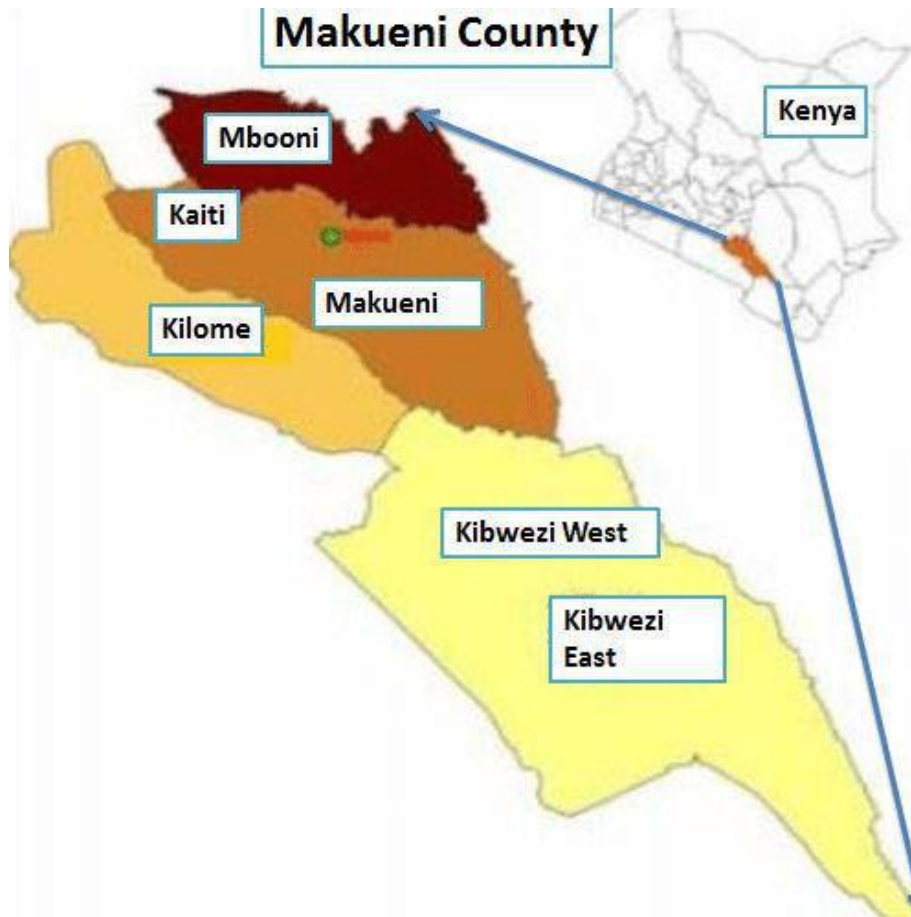


Figure 1: Makueni County administrative sub-counties

characterized by the high-grade index mineral sillimanite. A Tertiary phonolite lava flow forms a prominent feature in the north-eastern part of the area (Chyulu hills).



Plate 1: *Terminalia brownii* at Ngai Ndethya (left) and *Commiphora africana* woodland (Right) at Ngiluni



Plate 2: Water tank constructed by Kamungi Conservancy in partnership with Tsavo Trust at Ngiluni market

3.4 Population and Socio-economic activities

The 2017 projected population in Makueni County stands at 989,050 consisting of 481,593 males and 507,464 females. This is an increase from 884,253 persons as per the 2009 by Kenya National Population and Housing Census. The annual population growth rate stands at 1.4 per cent while the male-female sex ratio stands at 1:1. The county's population is predominantly rural based with less than 10% residing in urban areas. Settlement pattern is influenced by water availability, with hilly and high potential areas with enhanced rains and agricultural potential attracting high population with high density while the low marginal lands are sparsely populated (GoK, 2013).

Agro-pastoralism is the main source of income for most of the rural communities in the project area with agriculture accounting for over 80%, followed by wage employment at 10% and rural and urban self-employment at 8% and 4% respectively. Majority of the people in the project area are not employed and lack meaningful sources of livelihoods. The unemployed rely on agriculture for their livelihoods, largely involved in subsistence crop production. These economic activities are weather dependent and are not commercially viable. The major crops cultivated in the area are dryland crops like maize, cow peas and pigeon pea. Other dryland crops include sorghum, millet and cassava. Majority of farmers in the project area keep livestock as the area is very conducive for livestock keeping. The main livestock kept are cattle, goats, sheep and donkeys. The major source of farm power is animal draught power especially from oxen and donkeys.

Environmental degradation has occurred as a result of over-reliance on rain-fed agriculture. People have adopted unsustainable livelihood strategies like charcoal burning which continue to impact negatively on the environment (loss of biodiversity and encroachment to fragile ecosystem). Wood fuel is the main source of energy in the area and is thus highly affected by the enhanced unsustainable vegetation clearing for farmlands and construction. Renewable energy sources like solar are used by only a few households in the project area.

Human-Animal wildlife conflict is a major threat on the peoples' livelihoods. On a daily basis, there is a threat of game animals destroying farmers' crops and household property both during wet and dry seasons.

3.5 Hydrology and Water Resources

Mtito Andei River is the key river within the area. Other rivers in the neighbourhood include Kamunyuni, Kambu, Nthongoni among others. Water from these rivers supports a wide range of domestic and agricultural activities. The local community use the river to water livestock,

domestic. Some residents of the neighbourhood Mtito Andei town depend on the river for a number of uses such as domestic and construction activities.

The river base flow is characterised by very low flow (base flows) in dry season and moderate during rainy seasons. Most of the ephemeral streams in the proposed site generally become dry within one month after the rainy season. The flows are usually fast and turbid due to high sediment concentration associated with soil erosion in the catchment area.

3.6 Geology and Soils

The project area is overlain by a strong rocky basement with isolated pockets of well drained clay soils which have quartz and feldspar grains and felsic gravel rock fragments. The rocks have good quality engineering properties comparable to those of granites which support any engineering structures. The soil depths (thickness) vary from between 1m (upslope) at the project site to nearly 2.0m at the down slope sides of the Mtito Andei river. Generally, soil types in the proposed project sites and its neighbourhood include nitisols which are well drained, porous, with high moisture and stable structure, vertisols characterized by black cotton soil, poor drainage, high organic matter and andosols which are well drained, porous and contain high organic matter.

The project site has a similar geology composed of high grade regional metamorphic granitoid granulites which are composed of quartz and feldspars (over 90%) and mafic hornblende and pyroxenes (about 10% or less). The project site is far from any active seismicity.

3.7 Wildlife

The proposed project site, the Mtito Andei River and the neighbourhood locality are rich in wildlife. A number of small game within the site include snakes, squirrels, rabbits, lizards, geckos, frogs and a number of bird species. However, the wildlife in the area is under extreme disturbances from human activities. Disturbance to wildlife is expected to increase as the site is opened up for human settlement. Clearance of vegetation to allow settlement and farming activities will drastically alter the natural habitat for wildlife. Noise from construction machinery will also scare away most of the wildlife leading migration of the game. This small game contributes greatly to biodiversity in the locality. Further away from the project site is the expansive Tsavo National Park that is a source or sink for wildlife.

4 RELEVANT LEGISLATIVE AND REGULATORY FRAMEWORK

4.1 Introduction

It is part of Legal requirements within the Laws of Kenya that a development of such magnitude adheres to certain legal parameters. This section therefore describes the Policy, Legal, and Institutional framework pertaining to the proposed development. The policy, legal and institutional frameworks have been put in place to ensure that development projects adhere to environmental conservation at all times. As development activities have the potential to damage the environment, it is a challenge today to ensure that development efforts are sustainable.

The proposed development will change the landscape and among the environmental changes to be observed include exposure of the soils, compaction, loss of vegetation, waste generation etc. It is these issues amongst others that legislation sets to address. Through recognizing the importance of environmental conservation in all development endeavours, the Kenya government put in place a wide range of policy, institutional and legislative frameworks to guide developments in Kenya in the process of minimizing environmental degradation.

4.2 Environmental policy

In order to achieve economic development goals while safeguarding environmental integrity, the Kenya Government put in place the EMCA, 1999 to coordinate environmental activities in the country. The broad objectives of the national environmental policy include:

- Optimal use of natural resources while improving environmental quality;
- To conserve resources such that the resources meet the needs of the present without jeopardizing future generations in enjoying the same;
- Develop awareness that inculcate environmental stewardship among the citizenship of the country;
- Integrate environmental conservation and economic activities in the development process;
- Ensure that national environmental goals contribute to international obligations on environmental management.

To achieve this, it is a policy direction that appropriate reviews and evaluations of developmental plans and operations are checked to ensure compliance with the environmental policy.

4.3 Sessional Paper No. 3 of 2009 on National Land Policy

The National Land Policy was formulated with the aim of securing rights over land and provide for sustainable growth, investment and reduction of poverty in line with Government overall development objectives. The policy will offer a framework of policies and laws designed to ensure the maintenance of a system of land administration and management that will provide:

- (a) All citizens with opportunity to access and beneficially occupy and use land;
- (b) Economically viable, socially equitable and environmentally sustainable allocation and use of land;
- (c) Efficient, effective and economical operation of land markets;
- (d) Efficient and effective utilisation of land and land-based resources; and
- (e) Efficient and transparent land dispute resolution mechanisms.

4.4 Institutional Framework

At present there are over twenty (20) institutions and departments that deal with environmental issues in Kenya. Some of the key institutions include the National Environmental Council (NEC), National Environment Management Authority (NEMA), the Kenya Forest Service, Kenya Wildlife Services (KWS) and others.

4.4.1 National Environment Management Authority (NEMA)

The objective and purpose for which NEMA is established is to exercise general supervision and co-ordinate over all matters relating to the environment and to be the principal instrument of the government in the implementation of all policies relating to the environment. However, NEMA mandate is designated to the following committees:

4.4.2 National Environment Council (NEC)

EMCA 1999 No. 8 part iii section 4 outlines the establishment of the National Environment Council (NEC). NEC is responsible for policy formulation and directions for purposes of EMCA; set national goals and objectives and determines policies and priorities for the protection of the environment and promote co-operation among public departments, local authorities, private sector, non-governmental organizations and such other organizations engaged in environmental protection programmes.

4.4.3 National Shelter Strategy to the Year 2000

This strategy followed the international Year of shelter for the homeless in 1987 and was formulated to advocate a change in policy in order to allow other actors to come in and assist the government in providing housing.

4.4.4 The National Poverty Eradication Plan (NPEP)

The NPEP has the objective of reducing the incidence of poverty in both rural and urban areas by 50 percent by the year 2015; as well as strengthening the capabilities of the poor and vulnerable groups to earn income.

4.5 Environmental Legal Framework

Environmental Management and Co-ordination Act No. 8 of 1999, provide a legal and institutional framework for the management of the environmental related matters. It is the framework law on environment, which was enacted on the 14th of January 1999 and commenced in January 2002. Topmost in the administration of EMCA is National Environment Council (NEC), which formulates policies, set goals, and promotes environmental protection programmes. The implementing organ is National Environment Management Authority (NEMA). EMCA comprises of the parts covering all aspects of the environment.

Figure 4 below shows the EMCA Institutional Framework.

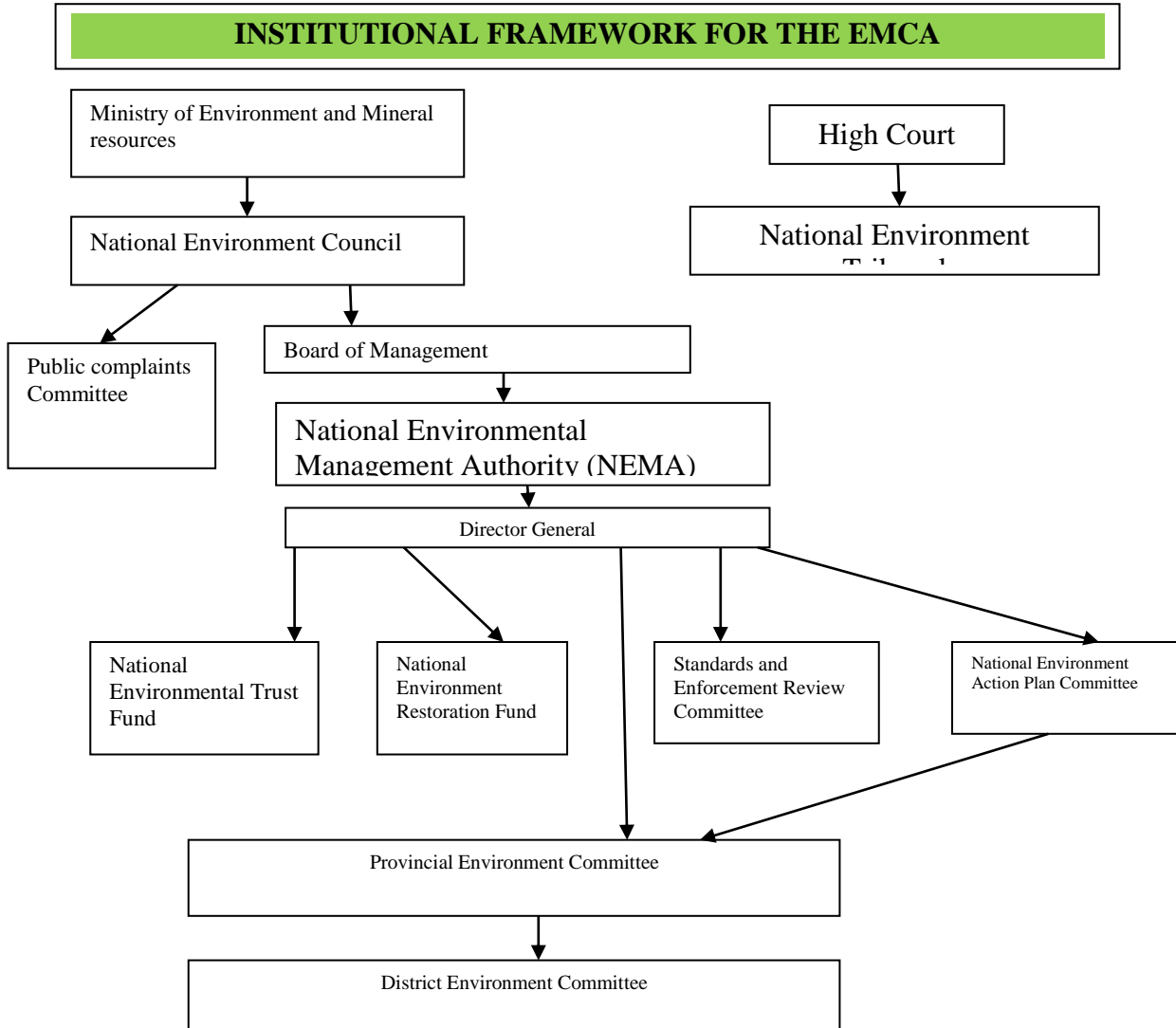


Figure 4: The EMCA, 1999 Institutional Framework

4.5.1 Constitutional provisions

Kenya now has a new Supreme law in form of the New Constitution which was promulgated on the 27th of August 2010 and which takes supremacy over all aspects of life and activity in the New Republic. With regard to environment, Section 42 of the Constitution states as follows:-

Every person has the right to a clean and healthy environment, which includes the right—

- (a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
- (b) to have obligations relating to the environment fulfilled under Article 70.

In Sections 69 and 70, the Constitution has *inter alia* identified National Obligations in respect of the environment and Enforcement of Environmental Rights respectively as follows:-

Section 69 (1): The State shall—

- (a) ensure sustainable exploitation, utilisation, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;*
- (b) work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;*
- (c) protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;*
- (d) encourage public participation in the management, protection and conservation of the environment;*
- (e) protect genetic resources and biological diversity;*
- (f) establish systems of environmental impact assessment, environmental audit and monitoring of the environment;*
- (g) eliminate processes and activities that are likely to endanger the environment; and*
- (h) utilise the environment and natural resources for the benefit of the people of Kenya.*

(2) Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Section 70 provides for enforcement of environmental rights thus:-:

(1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

(2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate—

- (a) to prevent, stop or discontinue any act or omission that is harmful to the environment;

- (b) to compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or
- (c) to provide compensation for any victim of a violation of the right to a clean and healthy environment.

(3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

Essentially, the New Constitution has embraced and provided further anchorage to the spirit and letter of EMCA 1999 whose requirements for environmental protection and management have largely informed Sections 69 through to 71 of the Document. In Section 72 however, the new constitution allows for enactment of laws towards enforcement of any new provisions of the Supreme Law.

4.5.2 County Government Act, 2012

The County Government Act, 2012 replaced the Local Government Act. It provides for the County governments' powers, functions and responsibilities. County governments consist of the county executive headed by the Governor, and the county Assemblies headed by the county speaker.

County planning and development, including-

- (a) Statistics;
- (b) Land survey and mapping;
- (c) Boundaries and fencing;
- (d) Housing; and
- (e) Electricity and gas reticulation and energy regulation.

It provides for the role of the County government in planning . Under section (37) of the Act, a county executive committee shall—

- (a) monitor the process of planning, formulation and adoption of the integrated development plan by a city or municipality within the county;
- (b) assist a city or municipality with the planning, formulation, adoption and review of its integrated development plan;

(c) facilitate the coordination and alignment of integrated development plans of different cities or municipalities within the county and with the plans, strategies and programmes of national and county governments; and

(d) take appropriate steps to resolve any disputes or differences in connection with the planning, formulation, adoption or review of an integrated development plan.

The County Government Act mandates County Governments to carry out spatial planning within their counties. Section 110 provides that a spatial plan for the county should contain a strategic assessment of environmental impact of the spatial development framework.

The County Government is obligated to provide a clean and safe environment within its area of jurisdiction.

4.5.3 The Land Registration Act, 2012

The Land Registration Act is in place to revise, consolidate and rationalize the registration of titles to land, to give effect to the principles and objects of devolved government in land registration, and for connected purposes. This Act applies to Subject to section 4, this Act shall apply to:

- (a) Registration of interests in all public land as declared by Article 62 of the Constitution;
- (b) Registration of interests in all private land as declared by Article 64 of the Constitution;
- and
- (c) Registration and recording of community interests in land.

Section 24 states that: (a) the registration of a person as the proprietor of land shall vest in that person the absolute ownership of that land together with all rights and privileges belonging or appurtenant thereto; and (b) the registration of a person as the proprietor of a lease shall vest in that person the leasehold interest described in the lease, together with all implied and expressed rights and privileges belonging or appurtenant thereto and subject to all implied or expressed agreements, liabilities or incidents of the lease.

4.5.4 The Environment and Land Court Act, 2011

This Act is in place to give effect to Article 162(2) (b) of the Constitution; to establish a superior court to hear and determine disputes relating to the environment and the use and occupation of, and title to, land, and to make provision for its jurisdiction functions and powers, and for connected purposes.

4.5.5 The National Land Commission Act, 2012 (No. 5 of 2012)

Section 5 of the Act outlines the Functions of the Commission, pursuant to Article 67(2) of the Constitution as follows 5(1):-

- (a) to manage public land on behalf of the national and county governments;
- (b) to recommend a national land policy to the national government;
- (c) to advise the national government on a comprehensive programme for the registration of title in land throughout Kenya;
- (d) to conduct research related to land and the use of natural resources, and make recommendations to appropriate authorities;
- (e) to initiate investigations, on its own initiative or on a complaint, into present or historical land injustices, and recommend appropriate redress;
- (f) to encourage the application of traditional dispute resolution mechanisms in land conflicts;
- (g) to assess tax on land and premiums on immovable property in any area designated by law; and
- (h) to monitor and have oversight responsibilities over land use planning throughout the country.

4.5.6 The Land Act, 2012

The Commission shall ensure that any public land that has been identified for allocation does not fall within any of the following categories:

- Public and that is subject to erosion, floods, earth slips or water logging;
- Public land that falls within forest and wild life reserves, mangroves, and wetlands or fall within the buffer zones of such reserves or within environmentally sensitive areas

Under the Land Act 2012 The Commission shall:

- Implement Settlement programmes on behalf of national and county governments as outlined in section 134 of the Land Act.
- Administer the Land Settlement Fund in accordance with section 135 of Land Act
- Manage the Land Compensation Fund
- Identify ecologically sensitive areas that are within public land and demarcate and take any other justified action on those areas and act to prevent environmental degradation and climate change in accordance with the Land Act.
- Reserve public land for the establishment of approved settlement programmes, and where public land is not available, purchase private land subject to the Public Procurement and Disposal Act, 2005 or any other law as provided for in section 134 (5) of the Land Act.
- Set aside land for investment purposes in accordance with section 12(3) of the Land Act.

- Approve compulsory acquisitions, wayleaves, easements and analogous rights.
- Ensure that the investments, in land benefit local communities and their economies.
- Make regulations prescribing the criteria for allocation of public land, such regulations to prescribe forms of ownership and access to land under all tenure systems.
- The procedure and manner of setting aside land for investment should respect mechanisms of benefit sharing with local communities.
- Undertake an inventory of all land based natural resources upon coming into force of the Land Act as stipulated in section 15(3) of the Land Act.

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. Part viii of this Act provides procedures for compulsory acquisition of interests in land. Section 111 (1) states that if land is acquired compulsorily under this Act, just compensation shall be paid promptly in full to all persons whose interests in the land have been determined. The Act also provides for settlement programmed. Any dispute arising out of any matter provided for under this Act may be referred to the Land and Environment Court for determination. The proponent has acquired land for the proposed project in accordance with this Act.

4.5.7 Land Registration Act, 2012

Under the Land Registration Act, 2012, the Commission shall:

- Constitute registration units in consultation with national and county governments
- Determine the form of a land register that shall be maintained, in each registration unit,
- Appoint a date for geo-referencing plans to be kept in a land registry;
- Serve as the depository of maps; the office or authority responsible for the survey of land shall submit to the Commission a copy of the cadastral maps for depositing
- Prescribe (through regulations) guidelines that the registrar shall follow before question has been obtained by fraud.
- Advise the cabinet secretary in making regulations, rules or prescribing any matters required under this Act and such regulations or rules shall be tabled before Parliament

4.5.8 National Land Commission Act, 2012

Under the National Land Commission Act, the Commission shall:

- on behalf of, and with the consent of the national and county governments, alienate public land;
- monitor the registration of all rights and interests in land;

- ensure that public land and land under the management of designated state agencies are sustainably managed for their intended purpose and for future generations;
- develop and maintain an effective land information management system at national and county levels;
- manage and administer all unregistered trust land and unregistered community land on behalf of the county government; and
- develop and encourage alternative dispute resolution mechanisms in land dispute handling and management.

(3) The Commission shall ensure that all unregistered land is registered within ten years from the commencement of this Act. Parliament may, after taking into consideration the progress of registration, extend the period set by the Commission under subsection.

(4) Within five years of the commencement of the NLC Act, the Commission, on its own motion or upon a complaint by the national or county government, a community or an individual review or grant disposition of public land to establish their propriety or legality.

(5) The Commission shall in consultation and corporation with the national and county governments, establish county land management boards for the purposes of managing public land.

4.5.9 Way leaves Act Cap 292

According to the Way leaves Act cap 292 Section 2, Private land does not include any land sold or leased under any Act dealing with Government lands. Section 3 of the Act states that the Government may carry any sewer, drain or pipeline into, through, over or under any lands whatsoever, but may not in so doing interfere with any existing building. Section 8 further states that any person who, without the consent of the Permanent Secretary to the Ministry responsible for works (which consent shall not be unreasonably withheld), causes any building to be newly erected over any sewer, drain or pipeline the property of the Government shall be guilty of an offence and liable to a fine of one hundred and fifty shillings, and a further fine of sixty shillings for every day during which the offence is continued after written notice in that behalf from the Permanent Secretary; and the Permanent Secretary may cause any building erected in contravention of this section to be altered, demolished or otherwise dealt with as he may think fit, and may recover any expense incurred by the Government in so doing from the offender.

4.5.10 Physical Planning Act, 1999

The Local Authorities are empowered under section 29 of the Act to reserve and maintain all land planned for open spaces, parks, urban forests and green belts. The same section,

therefore allows for the prohibition or control of the use and development of land and buildings in the interest of proper and orderly development of an area.

It provides for the preparation of a physical development plan for the purpose of improving the land and providing for the proper physical development of such land, and securing suitable provision for transportation, public purposes, utilities and services, commercial, industrial, residential and recreational areas, including parks, open spaces and reserves and also the making of suitable provision for the use of land for building or any other purposes.

The Physical planning act provides for the control of development and use of land in particular areas, especially where a project may involve sub divisions or amalgamations of land parcels or located in an area otherwise reserved for other use.

The objective of this Act is to promote harmony, convenience, comfort and beauty in land use. Section 29 of the Act empowers local authorities to control all development activities so as to ensure conformity to approved planning standards.

Section 30 states that any person who carry out development without permission will be required to restore the land to its original conditions.

The Act also provides an Environmental Impact Assessment for a project which is likely to have injurious impact on the environment. Such an EIA is approved by the National Environment Management Authority (NEMA).

4.5.11 Penal Code Act (Cap.63)

Section 191 of the penal code states that if any person or institution that voluntarily corrupts or foils water for public springs or reservoirs, rendering it less fit for its ordinary use is guilty of an offence. Section 192 of the same Act says a person who makes or vitiates the atmosphere in any place to make it noxious to health of persons /institution, dwelling or business premises in the neighbourhood or those passing along public way, commit an offence.

4.5.12 The Environment Management and Coordination Act (1999)

The Environmental Management and Coordination Act, 1999 came into force on 14th January 2000. Its overall objective is to provide for the establishment of an appropriate legal and institutional framework for the management of the environment. The Act provides framework legislation for several statutes in Kenya, which contain environmental provisions, and has direct relevance to the existing development. The Act entitles every person in Kenya to a clean and healthy environment.

Though there are other sectoral laws on environmental conservation, this is the supreme Act. It provides guidelines on issues of environment, stipulates offences and penalties and establishes NEMA. The second schedule of the Act lists the type of projects, which must be subjected to the EIA. The proponent appointed experts to conduct the EIA project report to seek approval before implementation as required by NEMA.

4.5.12.1 The Environment (Impact Assessment And Audit) Regulations, 2003

In exercise of section 147 of the EMCA, the Minister made these regulations which have provided the framework for carrying out EIAs and EAs in Kenya. This EIA project report is conducted in conformity with these regulations and EMCA, 1999.

4.5.12.2 The Environmental Management and Co-ordination (Water Quality) Regulations, 2006

These regulations set the standards of domestic water and waste-water. The regulations are meant for pollution control and prevention and provides for protection of water sources. The proposed project has no chance of significantly affecting the water quality as there is no specific water source near the project.

4.5.13 Water Act, 2002

The Act deals with control and conservation of water resources. It prohibits activities that may cause pollution to sources of water likely to be used for human consumption or domestic use or in the manufacture of food for human consumption. There is no direct source of pollution to the rivers or surface water near the proposed project site therefore; the surface water is not at a risk of pollution. Adequate measures will also be adapted within the project site to control erosions and runoff that may affect the quality of water.

4.5.14 Public Health Act (Cap. 242)

Part IX, section 115, of the Act states that no person/institution shall cause nuisance or condition liable to be injurious or dangerous to human health. Section 116 requires that Local Authorities take all lawful, necessary and reasonably practicable measures to maintain their jurisdiction clean and sanitary to prevent occurrence of nuisance or condition liable to be injurious or dangerous to human health. Such nuisance or conditions are defined under section 118 as waste pipes, sewers, drains or refuse pits in such state, situated or constructed as in the opinion of the medical officer of health to be offensive or injurious to health.

5 CHAPTER FIVE: PUBLIC PARTICIPATION AND CONSULTATION

5.1 Introduction

Public participation which is mandatory while undertaking Environmental Impact Assessment study may be defined as the involvement of individuals and groups that are positively or negatively affected by a proposed intervention (e.g, a project, a program, a plan, a policy) subject to a decision-making process or are interested in it. It is enshrined in the Kenya Constitution 2010, Article 10 (2): The national values and principles of governance. The purpose of involving the public in the proposed ESIA study by the Government of Makueni County was to inform the stakeholders about the study and its likely effects (positive and negative), canvass for their inputs, views and concerns, and take account of the information and views of the public on the project and decision making.

5.2 Sources of Information

One of the key information sources used during the Environmental Impact Assessment study was public participation conducted on 14th March, 2019, through administration of structured questionnaires (*See Attachment*) and open forum discussions. The purpose for such interviews was to:

Identify positive and negative impacts with a view to subsequently promoting and mitigating them respectively.

Establish the socio-economic profile of the community and to help in identifying any other miscellaneous issues that may bring conflict in the course of study's implementation.

1. Obtain local and traditional knowledge that may be useful for decision-making;
2. Facilitate consideration of alternatives, mitigation measures and trade-offs;
3. Ensure that important impacts are not overlooked and benefits are maximized;
4. Reduce conflict through the early identification of contentious issues
5. Provide an opportunity for the public to influence project design in a positive manner (thereby creating a sense of ownership of the proposal);
6. Improve transparency and accountability of decision-making; and
7. Increase public confidence in the project cycle.

The EIA team followed the laid down regulations as per the requirements of NEMA regulations, and ensured that owners and occupiers within the three sites of the proposed study area were consulted through questionnaires and interviews. The consultations and investigations examined the study's details and its potential impacts on the immediate surroundings. All the people interviewed welcomed the study's proposal of degazettement of

Ngai Ndethya settlement scheme in Kibwezi East Sub-county, Makueni County. However, these notwithstanding, some issues of concerns were raised as outlined below.



Plate 3: A section of the participants in Mbeetwani settlement scheme during the public participation meeting



Plate 4: One of the Environmental experts making contributions during the public meeting in Ngiluni settlement scheme



Plate 5: A section of the participants in Kathekani settlement scheme during the public participation meeting



Plate 6: The area Chief giving his views at Kathekani settlement scheme during the public participation meeting

5.3 Positive Issues enumerated by the participants

All the interviewed respondents were in favour of the project with regard to the following benefits:

5.3.1 Land ownership security and issuance of title deeds

The participants maintained that the success of the degazettement of Ngai Ndethya game reserve will benefit them with an approved human settlement scheme regularising land ownership in the area with eventual possibility of issuance of title deeds. This occurrence will have positive impact to the residents as they will enjoy land security tenure like other people in the county and the nation. Some members indicated that their human rights and dignity will have been upheld for them to enjoy peaceful existence in the scheme and cease to be illegitimate squatters they are often referred to. The prospects of such eventuality will restore their pride and determination to live in freedom exercising their rights in a dignified manner.

The issuance of title deeds to the pieces of land they occupy will also ensure that peace and assurance of the current and the future generations in the scheme is maintained in an environment of self-determination and respect. The current situation they felt somehow keeps them on the edge not sure whether they will be in the settlement scheme or they could be required to vacate their homes. With the issuance of title deeds and legitimization of their stay will be a motivation to secure loans and invest in permanent dwellings/construction of houses and businesses as well as farming and livestock rearing activities, which will improve their livelihoods options.

5.3.2 Enhanced livelihoods options for the local residents

The participants were emphatic that the success of the study will enhance their livelihoods options through giving them the motivation to participate in economic development activities without fear and reservations as they will be assured of security of land tenure. They decried the fact that currently majority of them are held back by uncertainty and fear, such that they cannot undertake serious investment in business and farming in the area owing to lack of land tenure security. Once the degazettement is effected, the local residents were confident that this perception will change and that they will be able to undertake full development on their land.

With such development realized, they reiterated that they will have enhanced livelihoods anchored on investment and diversification which will be beneficial to them, the county and the country in general. To the majority of the residents, the current situation in the scheme

hinders this progressive development which affects them and their families. They also cited high poverty rate as contributed by their lack to have express freedom to utilise their land to the fullest potential. They felt that upon the regularisation of their stay and issuance of title deeds, the situation will change to the better with positive impact to their livelihoods, human dignity and security.

5.3.3 Minimized human/wildlife conflicts

The local residents decried the current situation of human wildlife conflicts rampant in the area and averred that if the scheme is granted for proper human settlement, the issue of boundary disputes with the national park will cease. The government and other stakeholders involved in the efforts to construct an electric fence will proceed along the fixed boundaries which will help to minimise human wildlife conflicts. They also believed that they will at least have peace of mind and be motivated to invest in planting of fruit trees like mango and citrus, which at the moment is not feasible due to the elephant menace witnessed in the area.

The local residents narrated stories of frustrations due to the destruction of property ranging from farm crops, livestock loss and destruction of plastic water tanks by the jumbos and other wildlife from the park. They also spoke of long disputes with KWS and the government on compensation of life and property destroyed by wildlife. The degazettement of the game reserve would be part of the strategy to find lasting solution for the problem. On the same note, however, the relevant authorities and conservationists, although in agreement with these sentiments advised the local residents that due to their proximity to the sanctuary, they should be prepared to learn to coexist with the wildlife through initiation and support of sustainable programmes for their benefits. It was correctly pointed out putting up an electric fence is not a panacea to permanent solution for human wildlife conflicts considering the changing dynamics occasioned by climate change and interference with the previous corridors for wildlife movement in the park e.g the Standard Railway Gauge (SGR). As such, still much cooperation and collaboration will be expected from the local communities and the relevant authorities to explore mechanisms for sustainable management of wildlife which have worked well in other parts of the country and elsewhere in the world of conservation.

5.3.4 Enhanced environmental conservation

The participants expressed hope that the success of this study will persuade the government to effect the degazettement which will enable them to fully participate in environmental conservation starting with planting of trees in their homesteads and in public institutions like schools and churches. They will also intensify their efforts in planting of fruit trees in their farms as well as digging terraces to stem soil and water erosion which will be beneficial to

environmental conservation. It will also be a motivation for them to form conservation groups to stem out environmental degradation in protection of the rivers. They mentioned Mtito/Andei and Kambu rivers which have been faced with unprecedented degradation due to sand harvesting.

The county government of Makueni together with the local community through this conservation groups will have an opportunity to intensify conservation efforts to restore environmental integrity through sustainable programmes initiated for the benefit of the local community and the environment in general. These efforts will extend to eradication of charcoal burning currently rampant in the settlement scheme. The degazettement of the game reserve thus will be a positive outcome and motivation for the local community to participate in local conservation programmes.

5.3.5 Improved infrastructure and social development

The residents also were confident that upon degazettement of the game reserve, they will benefit from improved infrastructure and social development programmes just as it is happening in other settled areas in the county. This will span from enhanced road networks to reach some of the remote areas in the scheme, schools, dispensaries, health centers and other social amenities in the area. They pointed out that the current trends in infrastructure development was not adequate for the growing population in the area. This fact is evident from the long distances between schools and health facilities.

The community at the moment faces acute water shortage and they felt that efforts along establishment of water projects will be part of the anticipated infrastructural development in the area. This will also extend to the provision of electricity which is a catalyst of local development and establishment of business enterprises to cater for the needs of the bulging youth population who will have an opportunity to engage in self-employment endeavors to their benefit. They also felt that the expanded infrastructural development will open up the area and spur economic development in various sectors which will be of great benefits to the local community. Such development will also enable people to invest in their land and in the local markets with possibility of increasing the county's revenue base to enable it to achieve its development goals and services to the citizens.

5.3.6 Peaceful co-existence

Due to the current human wildlife conflict the residents felt that the strained relationship with KWS, Tsavo trust and David Sheldrick conservation organizations will be restored as a result of the implementation of this project. First, the issues of boundary disputes will be solved and people will be motivated to work to improve on their lives. The human dignity and respect for

private property will be restored hence removing the suspicion and antagonism witnessed in the current situation. The local community expressed optimism that the degazettement of the game reserve will enable them to explore peaceful coexistence with wildlife, due to their proximity to the national park.

The current antagonism creates an atmosphere of fear, hostility and distrust which hinders peaceful coexistence and sustainable wildlife conservation. Wildlife and other natural resources fall in the category of national resources to be managed for the benefit of the citizens. Citizens also have a duty to preserve and protect the loss of these invaluable resources, hence both the conservationists and the local residents have a duty to ensure that peaceful coexistence is achieved. The county government and the national government through KWS and the various organizations involved in conservation efforts should ensure that there is massive public awareness on the benefits of these resources and explore ways to establish long lasting solutions based on mutual understanding on the importance of these resources. The local community should be amenable to embrace sustainable management of wildlife resources through structured community engagement and discard the hardline stance premised on convenience for peaceful coexistence.

5.3.7 Business investment opportunities

The local residents maintained that the success of the study will ensure that the area is open for business investment opportunities for them and other stakeholders. Their proximity to an important national park offers business opportunities in the tourism subsector as well as in other sectors which will help in the spur of economic development in the area. They were in agreement that such opportunities will enhance the quality of life and enable the youth to get employment opportunities.

The current status of the settlement scheme is a major constraint and deterrent to attract investors in the area due to the questions of legitimacy of land ownership. The degazettement of the game reserve will therefore legitimize land ownership which will be a major boon for both local and national investors to venture into business enterprises in the area.

5.3.8 Improved land value

The participants were in agreement that upon degazettement of the game reserve and restoration of the human settlement scheme, the value of land will increase to the benefit of the local residents. They were confident that being close to two important transport corridors, i.e. the SGR and Nairobi Mombasa highway, they are likely to benefit from better land sales to prospective investors.

5.4 Negative issues enumerated by the participants

Majority of the respondents raised the following concerns about the proposed study:

5.4.1 Loss of part of wildlife sanctuary

Since wildlife heritage is a national resource, Tsavo national park will lose a substantial chunk of land vital for wildlife conservation and a migration corridor between Tsavo East and Tsavo West national parks to human settlement. This eventually coupled with the current SGR associated disruption of wildlife migration through the two national parks might complicate the already bad situation of human wildlife conflict witnessed in the area.

Mitigation measures

The proponent and the National Government through its agents (KWS) to work closely together with the local community to ensure that there is minimal human wildlife conflicts through fencing off the national park and initiating sound and sustainable conservation programmes that are sensitive to the local community.. Explore ways of establishing lasting partnerships in the management of wildlife resources.

5.4.2 Possible reduction of acreage in land holding

The local residents were apprehensive that the regularization of the settlement scheme and the eventual titling of land holding may lead to compulsory repossession and reduction of acreage of land holding to individual households already settled in the area. Some of them expressed fears that the government may impose a uniform maximum acreage that an individual can hold in the scheme thus causing disadvantage to some landholders.

Mitigation measures

The proponent is advised to adhere to the constitution and the relevant land laws governing settlement schemes in Kenya. People should not be dispossessed of their rightful share in regularization of the scheme in the subsequent titling efforts. The proponent is advised to embark on public sensitization to the affected residents in the scheme before fixing of individual land boundaries and issuing of the title deeds. There should be clear communication channels and public participation by the local residents to appraise them of the agreed mode of carrying out the entire process. The proponent to should ensure that all the relevant stakeholders are appraised of the conditions and terms of the demarcation and titling process. The proponent through public consultation to determine any reasonable acreage limit as may be applicable as per the national and county assembly laws pertaining to the particular settlement scheme. This includes safeguard of reasonable land holding per an individual and regulation of any parcels which might be held by individuals for speculation to the detriment of public good. The exercise should be premised on the principles of fairness as per the laws governing land ownership.

5.4.3 Increased domestic and family conflicts

The local community also raised issues of escalated domestic and family conflicts resulting from the degazettement of the game reserve. Since people have settled in the scheme for a long time without title deeds, the exercise might trigger family disputes especially for those arising from succession issues with some sibling intent to dispose their kin of their rightful share in the scheme. Some parcels might have been held by extended families which might also trigger land disputes among relatives.

Mitigation measures

The proponent is advised to follow the laid down procedures and laws through close collaboration with the local administrators, village elders, church leaders, local leaders and the close neighbours to determine the rightful heirs and owners of such parcels of land as they might arise in execution of land adjudication and titling.

5.4.4 Increased land disputes

Apart from family land disputes and conflicts, neighbours and other land owners may place counter land possession claims on the same land parcel as well as claims for shifting of land demarcation boundaries by some dishonest land owners. If this is not effectively addressed, it may result to acrimony, distrust and violence between neighbors, who might have peacefully coexisted before the exercise. Such eventualities may escalate to nagging security problems in the area with devastating effects on lives and property.

Mitigation measures

The proponent is advised to initiate a mechanism for land dispute solution through engagement of local administrators, village elders, local leaders, church/community leaders and neighbours to reach amicable solutions to such disputes. The exercise should also be precedent by inclusive public sensitization and participation to ensure that the exercise is fully understood before commencement of the exercise. As such the proponent should initiate local alternative dispute resolution mechanism process across all the affected location beforehand to handle such disputes.

5.4.5 High cost of survey

The participants aware that land value is expected to rise once regularization is effected, expressed fears that the cost of survey and issuance of title deeds would be high to the

majority of the land owners. They felt that the cost of survey may be an impediment to some families to be able to acquire title deeds for their parcels of land.

Mitigation measures

The proponent through public participation and consultation to set such conditions for the land adjudication and survey as well as titling which is affordable and within reach of the majority of the settlers. This process should be guided by the relevant national and county legislation for the purpose of ensuring that no resident is affected by exorbitant fees to enjoy the right of land ownership in the scheme.

5.4.6 Indiscriminate sale of land/landlessness

Upon the degazettement of the game reserve and issuance of title deeds some community members and residents expressed fears that there might be indiscriminate sale of land by some of the local residents which might lead to massive landlessness affecting families and siblings of such households. This fear is premised on the anticipated land value increase and increased demand for land by other people from within the county and the country who will be motivated by the fact that the land will now have titles for legitimacy.

Mitigation measures

The proponent is advised, through public participation forums to conduct due diligence on genuine land owners and hold sensitization meetings to the public to educate them on the need to preserve their land for the benefit of their children and future generations. The proponent to establish mechanism for vetting of land owners to avoid the issuance of land to land speculators not entirely motivated by genuine need of land, other than for speculation purposes. This can be achieved through the engagement of local administrators, local leaders and other stakeholders to identify genuine land owners in the scheme.

5.4.7 Loss of biodiversity

Some of the residents raised the issues of loss of biodiversity especially in the loss of High Value Multi-Purpose Trees (HVMTs) currently found in the area. They pointed out that the expected upsurge of population in the area will lead to loss of both fauna and flora in the area due to clearing of vegetation for expansion of agriculture.

Mitigation measures

The proponent in conjunction with conservation organizations in the area to intensify environmental conservation efforts through public sensitization and exploring ways of establishing sustainable wildlife management and collaboration with the local community to initiate such conservation programmes in the area. They should also include the component of alternative sources of energy to mitigate charcoal burning.

5.4.8 Environmental degradation and deforestation

The anticipated population growth, land fragmentation and agricultural intensification in the area might trigger environmental degradation and deforestation a factor mentioned in the public participation forum in the area. Due to climate change effects agricultural production has declined, with farmers clearing large tracts of vegetation to increase their agricultural production. This will impact negatively on the environment. Demand for increased construction materials may lead to over-exploitation of sand from the various rivers traversing the area, hence affecting water sources and the environment in general.

Mitigation measures

The proponent is strongly advised to initiate measures to regulate sand harvesting and other unsustainable exploitation of natural resources in the area and especially charcoal burning. To this end the proponent should work closely with conservationists in the area and establish local conservation committees to spearhead environmental conservation campaigns through collaborative community initiatives.

CHAPTER SIX: IMPACTS OF THE PROJECT

6.1 Introduction

This Chapter identifies both positive and negative impacts associated with the proposed study. The potential impacts of the project have been categorized into two major categories i.e. impacts on the natural environment on the one hand, and impacts on human environment on the other. These impacts are further identified at two distinct phases of the study i.e. – Degazettement Phase and Operation Phase. The degazettement phase impacts relate to activities currently carried out in Ngai Ndethya Game Reserve which include human settlement, farming, livestock rearing and rural businesses in markets and wildlife conservation. Operational phase impacts are associated with the activities carried out in Ngai Ndethya settlement scheme i.e. human settlement, farming and livestock rearing and rural businesses in markets during the operation.

The magnitude and significance of impacts were gauged using an objective scale that took into consideration the following:

1. Temporal – short term or long term.
2. Spatial – Trans boundary/local.
3. Severity – Reversible/irreversible, temporary/permanent.

The scale that was applied in the analysis of impacts is shown in the following Table.

Table 2: Levels of Scale used in the Project

Value	Description	Scale Description
0	No impact	This means that to the best knowledge of the expert, the particular activity/action will not have any known impact on the environment. Such an impact will not in any way affect the normal functioning of either the human or the natural systems and does not therefore warrant any mitigation.
1	Minimal impact	Any activity with little impact on the environment calls for preventive measures, which are usually inexpensive and manageable. Such activities have minimum impacts on either natural or human environment or both.

2	Moderate impact	A moderate impact will have localized effect on the environment. If the effect is negative and cumulative, action in form of mitigation measures needs to be put in place to ensure that it doesn't become permanent and /or irreversible.
3	High impact	An impact is high if it affects a relatively high area (spatial), several biological resources (severity) and/or the effect is felt for a relatively long period (temporal) e.g. more than one year. In case the effect is negative, such an impact needs to be given timely consideration and proper mitigation measures put in place to prevent further direct, indirect or cumulative adverse effects.
4	Very high impacts	Such an activity rates highly in all aspects used in the scale i.e., temporal, spatial and severity. If negative, it is expected to affect a huge population of plants and animals, biodiversity in general and a large area of the geophysical environment, usually having trans boundary consequences. Urgent and specialized mitigation measures are needed. It is the experts' opinion that any project with very high negative impacts MUST be suspended until sufficient effective mitigation measures are put in place.
5	Not known	There are activities for which impacts are not yet known e.g. some chemicals are suspected to produce carcinogenic effects but this has not yet been confirmed.

6.2 Degazettement Phase Impacts

6.2.1 Negative Environmental Impacts

6.2.1.1 Loss of Part of Wildlife Sanctuary

During Degazettement phase, Tsavo national park will lose a substantial chunk of land (Ngai Ndethya Game Reserve) vital for wildlife conservation and a migration corridor between Tsavo East and Tsavo West national parks to human settlement. This coupled with the current

SGR associated disruption of wildlife migration through the two national parks might complicate the already bad situation of human wildlife conflict witnessed in the area. Since human wildlife conflicts exists at the moment, the EIA experts considered the advice that the boundaries of the national park should be fenced off and intensification of public awareness of the importance of joint conservation of wildlife heritage. This impact will be minimal (value of 2).

6.2.2 Positive Environmental Impacts of degazettement Phase

6.2.2.1: Peaceful coexistence with communities and wildlife

The degazettement of the game reserve may hold key to finding long lasting solutions on the current situation of human/wildlife conflicts in the area emanating from constant boundary disputes between the park and human settlement area. The rampant destruction of crops, fruit trees and loss of life due to wildlife and the law enforcement mechanism abets destruction of the environment due to these sticking issues hence the strained relationship between KWS, Tsavo trust and David Sheldrick conservation organizations. In this kind of situation, it is imperative to note there cannot be sustainable mechanisms for structured sustainable environmental conservation measures as long as the antagonism and bad blood exists between the key stakeholders and the local residents. The degazettement offers permanent resolving of the issues of boundary disputes, legitimization of the settlement scheme, hence the motivation for environmental conservation efforts. Peaceful coexistence and establishment of alternative dispute mechanisms as well as resolving localized problems is a perquisite for sustainable environmental conservation.

6.2 Operational Phase

6.2.3 Negative Environmental Impacts

6.2.3.1 Loss of biodiversity

The study findings indicate there will be a minimal level risk of loss of biodiversity due to increase of human settlement in the area. If not well mitigated agricultural expansion and wanton destruction of trees will and vegetation may lead to adversarial environmental degradation in the area. It also leads to decline of fauna and flora. This impact will be minimal (value of 1) since there already exists settled people in the area and the environmental laws and regulation of human activities in the county in regard to natural resources exploitation i.e. sand harvesting and charcoal burning. Sound environmental conservation measures will be undertaken during the operational phase of the project.

6.2.3.2 Environmental degradation and deforestation

The anticipated population growth, land fragmentation and agricultural intensification in the area might trigger minimal environmental degradation and deforestation in the area during operation phase. This impact will be minimal value (value of 1). Sound environmental conservation measures will be undertaken during the operational phase of the project

6.2.4 Positive Environmental Impacts of Operational Phase

6.2.4.1 Optimal use of land

At the operational phase of the scheme there will be optimal use of land benefiting the landless and discouraging land grabbing and land holding for purposes of land speculation. The current land will be put into productive purposes benefitting the local residents and the county in general.

6.2.4.2 Enhanced livelihoods options for the local residents

The operational phase of the study will lead to enhanced and improved livelihoods of the local community owing to land tenure security and the anticipated motivation for their participation in various economic activities. This will impact positively on the community's livelihoods outcomes buttressed by diversification of economic activities, a factor which will improve on their economic status and participation in nation building activities.

6.2.4.3 Enhanced environmental conservation

At the operational phase the local residents will freely fully participate in environmental conservation starting with planting of trees in their homesteads and in public institutions like schools and churches. They will also intensify their efforts in planting of fruit trees in their farms as well as digging terraces to stem soil and water erosion which will be beneficial to environmental conservation. It will also be a motivation for them to form conservation groups to stem out environmental degradation in protection of the rivers. They mentioned Mtito/Andei and Kambu rivers faced with unprecedented degradation due to sand harvesting.

6.2.4.4 Minimised human/wildlife conflicts

The operational phase of the study anticipates there will be minimized human/ wildlife conflict in the area partly due to the delineation of park boundaries and subsequent fencing and confinement of wildlife within the park. Proper human settlement will resolve boundary disputes with the national and local residents encouraging them to enter into structured partnership to enhance environmental

conservation in the area. Such an eventuality will impact positively to the environment and the vital ecosystem obtaining in the area.

6.2.4.5 Business investment opportunities

The operational phase will also encourage local, national and international investors to invest in the area with positive impacts in addressing youth unemployment and supporting environmental conservation. The tourism subsector has high potential to take root in the area in the form of hotels and establishment of conservancies which will impact well on the area benefitting the local community, the county and the country's overall economic development and environmental conservation.

6.3 Decommissioning Phase

6.3.1 Negative Environmental Impacts

6.3.1.1 Loss of livelihood and economic ruin

The establishment and regularisation of the settlement scheme will bring about a lot of positive change and impact to the lives of the people around it and also to the local economy. Decommissioning thus will thus mean a reverse of these gains whereby many will lose their source of livelihood from jobs to business ventures hence directly leading to a decline of the area's economic stature and a drawback to the economy at large. This impact will however be minimal (value of 1) since other sources livelihood and alternative settlement would have been established by the time decommissioning phase is reached.

6.3.1.2 Lack of human settlement scheme

Decommissioning of the scheme will lead to lose of human settlement scheme, hence loss of dwellings and homes as well as farms which will be a major disruption and setback to the lives of the local resident. However, it is expected that alternative land will have been identified to replace the old settlement scheme new. This impact is therefore minimal (value of 1).

6.3.2 Positive Environmental Impacts of Decommissioning Phase

6.3.2.1 Aesthetics as a result of landscaping and restoration of the site to original status

Upon decommissioning of the scheme, rehabilitation, restoration and environmental conservation will be undertaken to restore it to its original status or to a better state than it was originally. This will include re-vegetation which will lead to improved visual quality of the area. This will also mean that alternative options can be utilized within the scheme including the consideration for its original intended purpose.

6.3.2.2 Employment Opportunities

During the decommissioning process, several people will be involved. As a result, several employment opportunities will be created during the phase of the proposed project.

7 MITIGATION MEASURES AND MONITORING PROGRAMMES

This section highlights the mitigation measures for the expected negative impacts of the proposed project. The potential impacts and the possible mitigation measures have herein been analyzed under two categories: Degazetement, Operational/Implementation.

7.2 MITIGATION OF DEGAZZETEMENT RELATED IMPACTS

7.2.1 Loss of Part of Wildlife Sanctuary

To reduce and mitigate the anticipated loss of wildlife, the following measures will be taken:

- Set clear boundaries between the park and the settlement area
- Fence the boundary with electric fence to reduce the wild from disturbing the neighbours
- Intensification of public awareness of the importance of joint conservation of wildlife heritage.
- Awareness on peaceful coexistence

7.2.2 Loss of biodiversity

In order to control loss of diversity within the project site the following measures shall be implemented during operational stage of the project:

- **Avoidance:** this will comprise measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of infrastructure or disturbance. For example, placement of roads outside of rare habitats or key species' breeding grounds, or timing of seismic operations when aggregations of whales are not present. Avoidance is often the easiest, cheapest and most effective way of reducing potential negative impacts, but it requires biodiversity to be considered in the early stages of a project.
- **Minimisation:** measures that will be taken to reduce the duration, intensity and/or extent of impacts that cannot be completely avoided. Effective minimisation can eliminate some negative impacts. Examples include such measures as reducing noise and pollution, designing power lines to reduce the likelihood of bird electrocutions, or building wildlife crossings on roads.

- **Rehabilitation/restoration:** measures that will take to improve degraded or removed ecosystems following exposure to impacts that cannot be completely avoided or minimized. Restoration tries to return an area to the original ecosystem that occurred before impacts, whereas rehabilitation only aims to restore basic ecological functions and/or ecosystem services (e.g. through planting trees to stabilize bare soil). Rehabilitation and restoration are frequently needed towards the end of a project's life-cycle, but may be possible in some areas during operation (e.g. after temporary borrow pits have fulfilled their use). Collectively **avoidance, minimization and rehabilitation/restoration** serve to reduce, as far as possible, the residual impacts that a project has on biodiversity. Typically, however, even after their effective application, additional steps will be required to achieve no overall negative impact or a net gain for biodiversity.

- **Offset:** measures taken to compensate for any residual, adverse impacts after full implementation of the previous three steps of the mitigation hierarchy. Biodiversity offsets are of two main types: 'restoration offsets' which aim to rehabilitate or restore degraded habitat, and 'averted loss offsets' which aim to reduce or stop biodiversity loss (e.g. future habitat degradation) in areas where this is predicted. Offsets are often complex and expensive, so attention to earlier steps in the mitigation hierarchy is usually preferable.

- **Supporting Conservation Actions:** measures taken which have positive – but difficult to quantify – effects on biodiversity. These qualitative outcomes do not fit easily into the mitigation hierarchy, but may provide crucial support to mitigation actions. For example, awareness activities may encourage changes in government policy that are necessary for implementation of novel mitigation, research on threatened species may be essential to designing effective minimization measures, or capacity building might be necessary for local stakeholders to engage with biodiversity offset implementation.

7.2.3 Environmental degradation and deforestation

Appropriate management will be achieved when resources are used efficiently or conserved because of their important ecological role in sustaining ecosystems. In order to control extensive environmental degradation and deforestation the following measures shall be implemented during operation phase of the project.

- Proper Gardening which will be done through planting vegetation and grass can stop heavy rains from damaging our land and it will protect the topsoil from being washed away.

- Afforestation and Reforestation programmes to be implemented in the three sites.
- Conservation tillage to be practised by all farmers to ensure minimum soil disturbance.
- Using fertilizers and manure to restore and boost the soil fertility.
- Minimization of vegetation disturbance: Reducing disturbance of vegetation in the project area will be preservation of individual trees within the site.

8 ANALYSIS OF PROJECT ALTERNATIVES AND THE PROPOSED ACTION

8.1 Introduction

This section analyses the project alternatives in terms of site location options.

8.2 Relocation Option

Relocation option means that the locals who have already permanently settled in the three settlement schemes will have to be relocated to other places. This is an expensive undertaking which requires a lot of resources, time and political good will. It also means identifying a suitable place where these permanently settled families will have to be relocated to. This will result to social and institutional disruptions through demolition of family houses and property, and also institutions like schools that are already permanently constructed in the area. This is a very expensive undertaking and therefore not plausible or affordable to the client. In view of this, relocation of the project is not a viable option.

8.3 No Project Alternative option

The No Project option in respect to the proposed project implies that the status quo is maintained. This option is the most suitable alternative from the environmental perspective as it ensures non-interference with the existing conditions. This option will however, involve several losses both to the client and the community at large. The No Project Option is the least preferred from the socio-economic and environmental perspective due to the following factors:

- i. The current human-animal conflict which is expected to be contained by the degazettment will continue
- ii. Farmers will continue incurring huge losses due to the current destruction of their crops, livestock and property.
- iii. The economic status of the local community would remain unchanged since without title deeds which are expected to be issued after the degazettment process is complete, their credit worthiness remains low.

Thus, from the above, the No Project alternative is not suitable to the local people in the three settlement scheme components.

8.4 The Proposed Degazettment Alternative

Under the proposed degazettment alternative, the proponent would be issued with an EIA License. In issuing the license, NEMA would approve the proponent's degazettment process, provided that all environmental statutory requirements are met during the degazettment of the settlement schemes. This alternative consists of the applicant's final proposal with the inclusion of the NEMA regulations and procedures as required. This is the most viable option as it will among other socio-economic benefits ensure permanent settlement of the locals and enhance their economic capacity once the title deeds are issued. It will also minimise human-Wildlife conflicts once clear boundary demarcation is done, followed by a physical separation of the wildlife from human. Security of the locals will be boosted especially from the wild animals.

8.5 EIA With/Without Environmental Management Plan (EMP)

8.5.1 With EMP

If the environmental management strategies discussed in this report are fully implemented, the adverse impacts of the project would be greatly minimized, and therefore there will be an overall socio-economic and environmental improvement of the people within the project area. Thus, this remains the most preferred option.

8.5.2 Without EMP

This scenario is based upon the assumption that the proposed degazettment process would go ahead without any environmental management plan. The total project impact for this scenario would be appreciably adverse. This means that it would be difficult to monitor the operations, performance and impacts of the project without an EMP, which in the long run can have serious adverse effects on the environmental and socio-economic health of the intended beneficiaries. Thus, this assumption is disqualified and not applicable since the greatest challenge worldwide presently is sustainable development and sustainable use of natural resources and environmental conservation, which can easily be attained where an EMP is in place.

9 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

9.2 Introduction

The proponent of the proposed project acknowledges the fact that the proposed project activities will have some impacts on the biophysical environment, health, safety and socio economic well-being of the local residents. Thus, the main focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities through a programme of continuous improvement.

An environmental management/monitoring plan has been developed to assist the proponent in mitigating and managing environmental impacts associated with the life cycle of the project. The EMP has been developed to provide a basis for an Environmental Management System (EMS; ISO 14001 principles) for the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the EMP. As such, the EMP will be subject to a regular regime of periodic review.

Tables 2, and 3 form the core of this EMP for the degazettement, operational and decommissioning phases of the proposed project respectively. In general, the tables outline the potential safety, health and environmental risks associated with the project and detail all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring. The EMP will be used as checklist in future environmental audits.

9.3 Degazettement/Operation Phase Environmental Management Plan

The necessary objectives, activities, mitigation measures, and allocation of costs and responsibilities pertaining to prevention, minimization and monitoring of significant negative impacts and maximization of positive impacts associated with the degazettement and operation phases the proposed project are outlined in **Table 2 below**

Table 3: Environmental Management & Monitoring Plan for the proposed Degazetement project

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
1. Curb project associated conflicts e.g. Disputes with neighbourhoods				
Project implementation disputes	Community support mobilization and sensitization through consultative forums, public meetings & questionnaire methods	Proponent & EIA Experts	Project Planning Phase	-
	Draft, finalize, and implement land acquisition, compensation and resettlement plan for affected households, businesses, public utilities, and other groupings using participatory approach	Proponent	Project Planning Phase	-
	Land transfer agreements should be formalized before the project start as per the laws of the land	Proponent/Government of Kenya	Project Planning Phase	-
	Sufficient planning for adequate resources required i.e. financial, personnel and equipment	Proponent	Project Planning Phase	-
	Restrict project within the corridor set as much as possible	Proponent & KWS	Project Implementation Phase	-
2. Bio-Diversity Conservation - Minimize vegetation disturbance at and or around project site				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
Vegetation disturbance	Ensure proper demarcation and delineation of the project area to be set for human settlement and the National park.	County Government Surveyors	3 month	Varied
	Introduction of vegetation (trees, shrubs and grass) on open spaces and their maintenance	Local Residents / Proponent	Through out	10,000,000
	Create awareness on importance of bio-diversity amongst the local residents	Proponent	Through out	-
	Design and implement an appropriate Reforestation/Afforestation, landscaping programme to help in re-vegetation of the project area after settlement.	Local Community/Environmental officers	Through out	100,000
3. Minimize Human-Wildlife Conflicts				

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
<p>an-wildlife conflicts can have adverse impacts on wildlife and humans alike</p>	<p>The best approach is represented by changing attitudes to wildlife through education and by ensuring that affected communities and individuals are active participants in, and enjoy tangible benefits from, wildlife management</p> <p>Completely removing either the people or the animals, physically separating the two by the use of barriers, managing by a variety of means the numbers of animals to reduce the risk of conflict, and employing a variety of scaring and repelling tactics.</p> <p>Managing the size of the population to reduce the risk of human-wildlife conflict arising. These include selectively killing animals as well as controlling their reproduction.</p> <p>Exclusion of wild animals by use of physical barriers, which are properly designed, constructed and maintained, fences.</p>	<p>Proponent, KWS, Local Conservancy NGO's within the locality and Provincial Administration</p>	<p>Throughout Degazetement/Implementation phase</p>	<p>Varied</p>

Expected Negative Impacts	Recommended Mitigation Measures	Responsible Party	Time Frame	Cost (KShs)
4. Reduce storm-water, runoff and soil erosion				
Increased storm water, runoff and soil erosion	A storm water management plan that minimizes impervious area infiltration by use of recharge areas and use of detention and/or retention with graduated outlet control structure will be designed	The Civil Engineers, Mechanical Engineers and Local residents	Through out	200,200
	Apply soil erosion control measures such as terracing of farm land within the project site to reduce run-off velocity and increase infiltration of storm water into the soil.	The Civil Engineers, Mechanical Engineers and Local Community	Though out	
	Excavations to remain open for very short time before placement of fill to minimize potential for entry of surface water runoff into excavations.			
5. Environmental monitoring of the project				

Environmental concern during the operation phase	Due to the magnitude of the project the proponent will liaise with the environmental officers ensure that the conditions of approval are adhered to.	Proponent, and Environmental Officers	Throughout Degazetement/Implementation phase	
6. Improved health and sanitation throughout project cycle				
Poor health and sanitation as a result of the project activities	Create awareness prevention on HIV/AIDS and other related diseases Avail health care services to the local community Provide adequate drinking water to the local community	Proponent in corroboration with the Ministry of Health (Basic Health Care, Public Health and Sanitation), Local NGOs and the Provincial Administration	Throughout Degazetement/Implementation phase	
7. Maintenance of Infrastructure and Natural Resources				

Impacts on local infrastructure, services and natural resources	<p>All roads being used at the project site should be well maintained, and left in as good state, or better than their current state.</p> <p>Involve the community during road upgrades.</p> <p>Natural Resources within the project site should be conserved</p>	Proponent	Throughout Degazetement/Implementation phase	Varied
8. Ensure environmental compliance				
Environmental Law Compliance	Undertake an environmental audit within after operation commences as required by law	Environmental consultant	12 months after operation commences	100,000

9.4 Decommissioning Phase

In addition to the mitigation measures provided in above, it is necessary to outline some basic mitigation measures that will be required to be undertaken once all operational activities of the project have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the project are outlined here below and in Table 3 below.

- i. Landscaping of open areas should be done. Such areas should be sealed from pits and other depressions and vegetation introduced.
- ii. All waste materials should be cleared and removed from the site and dispersed appropriately. There should be no such materials as wood, glass, stones, scrap metals, etc.
- iii. General rehabilitation of any excavated areas; quality vegetation should be introduced to add aesthetic value to the site. This should be watered regularly.
- iv. The structures should be cleared and rubbed of any dust particles
- v. All construction equipment and plants should be removed and the old ones sold to the respective scrap materials handlers.
- vi. Workers should be pre-warned just before decommissioning and suitably compensated and recommended in seeking opportunities elsewhere.

Table 4: Details of Decommissioning Plan

Activity/ Issue	Action Required	Responsible Party	Frequency
EIA	Project decommissioning EIA	Proponent and NEMA	Once-off
Design	Project decommissioning design	Appointed decommissioner	Once-off
Excavation	Excavation of the entire construction	Appointed decommissioner	Once-off
Disposal	Disposal of materials	Appointed decommissioner	Once-off
Clean up	Clean up and rehabilitation of the site	Appointed decommissioner	Once-off
Rehabilitation	Areas under rehabilitation must be demarcated with danger tape to prevent vehicular and human access. Refill the site and re-vegetate the land	Appointed decommissioner	Once-off
Removal of materials	All materials to be removed in an appropriate manner	Appointed decommissioner	Once-off
Monitoring	Post decommissioning monitoring	Proponent/ NEMA	Once-off

10 CONCLUSION AND RECOMMENDATION

The proposed project will have numerous positive impacts as it has been outlined in the report. The negative environmental impacts that will result from implementation of the project can be mitigated.

The proponent of the proposed project shall be committed to putting in place several measures to mitigate the negative environmental, safety, health, and social impacts associated with the life cycle of the project. It is recommended that in addition to this commitment, the proponent shall focus on implementing the measures outlined in the EMP as well as adhering to all relevant national and international environmental, health and safety standards, policies and regulations that govern establishment and operation of such projects.

It is also recommended that the positive impacts that emanate from such activities will be maximised as much as possible. It is expected that these measures will go a long way in ensuring the best possible environmental compliance and performance standards towards the goal of achieving sustainable development.

It is our recommendation that the project be allowed to go on provided the mitigation measures outlined in the report are adhered to, Environmental Management Plan (EMP) is implemented and the developer adhere to the conditions of approval of the project.

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APPENDICES

1. Letter from Cabinet Secretary Ministry of Environment and Natural Resources
2. Report on Stakeholders meeting held on 22nd January 2018
3. Attendance List for stakeholders meeting
4. Certificate of Firm of Experts Registration from NEMA
5. Lead Experts Practicing Licences
6. A sample of questionnaires used during the field study