ENVIRONMENTAL AND SOCIAL IMPACT ASSESMENT STUDY REPORT FOR THE PROPOSED LOW IMPACT ECOTOURISM FACILITY AT MURUNYA CAMP SITE, IN OLOOLUA FOREST, KAJIADO COUNTY.

TOR: NEMA/ENVIS/EIA/TOR/Approval_0297



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SEPTEMBER 2026

CERTIFICATION

We, the undersigned, hereby submit this **Environmental Study Report for the Proposed Low Impact Eco-Tourism Facility In Kajiado County**. We hereby certify that, to the best of our knowledge and professional judgment, the information, findings, assessments and recommendations contained in this Study Report are based on the site assessment, project information and documentation provided by the Proponent, field investigations, stakeholder consultations and other relevant information available to the Environmental Consultants at the time of preparation of the report.

The report has been prepared in accordance with the applicable provisions of the **Environmental Management and Co-ordination Act (EMCA), Cap. 387**, the **Environmental (Impact Assessment and Audit) Regulations**, and other applicable environmental laws, regulations, standards and guidelines of the Republic of Kenya.

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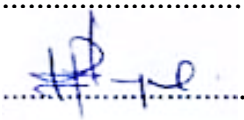


Signature..... Date .....02/09/2026.....

PROPONENT

I, the undersigned, being the duly authorized representative of **EMPAKASE CONSERVATION COMMUNITY BASED ORGANIZATION**, hereby certify that the information, particulars and documentation provided to the Environmental Consultants relating to the proposed project, including the project description, land ownership/use details, proposed development components, operational arrangements and associated project information, are true, accurate and complete to the best of my knowledge and belief.

Name.....**PETER KAIPEI MELONYIE**.....

Designation.....CHAIRMAN.....,.. Signature ..........

Date .....01/09/2026.....

ON BEHALF: **EMPAKASE CONSERVATION COMMUNITY BASED ORGANIZATION** ...

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ABBREVIATIONS

CIDP	County Integrated Development Plan
Covid-19	Corona Virus Disease
EA	Environmental Audit
EDL	Effluent Discharge License
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Coordination Act
ESMMP	Environmental and Social Management and Monitoring Plan
EMS	Environmental Monitoring System
Ha	Hectare
ILO	International Labour Organisation
KES	Kenya Shillings
KPLC	Kenya Power & Lighting Company Limited
KWS	Kenya Wildlife Services
LR No	Land registration number
MDG's	Millennium Development Goals
NCA	National Construction Authority
NEAP	National Environment Action Plan
NEMA	National Environmental Management Authority
OSHA	Occupational Safety and Health Act
PCM	Public Consultation Meeting
pH	Potential of Hydrogen
PPE	Personal Protective Equipment
TOR	Terms of Reference
UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
WRA	Water Resources Authority

NON-TECHNICAL SUMMARY

Introduction

Empakase Conservation Community Based Organisation (CBO) is the Project Proponent for the proposed **Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County**. The proposed development will occupy approximately 7.63 acres (3.09 hectares) within Oloolua Forest Station, which forms part of the Nairobi Conservation Area. The site is located approximately 4.5 kilometres from Ngong Township in Kajiado County. The project is **authorized under Special Use License No. LIC003/2026, issued by the Kenya Forest Service** (KFS) on 30 March 2026. The proposed development is to be undertaken within a gazetted forest environment and will therefore be implemented under a conservation-led approach, with particular emphasis on protection of the existing forest ecosystem.

The project is conceived as a low-impact, forest-sensitive ecotourism destination combining environmental education, recreation, hospitality and immersive visitor experiences. At its center will be a robotic dinosaur theme park, complemented by an interpretation/museum facility, eco-restaurant, raised eco-lodges/cottages, picnic and children's recreational facilities, eco-toilets, administration and ticketing facilities, nature trails and a modern indigenous tree nursery. Unlike conventional tourism developments, the proposed facility is intended to use the existing Oloolua Forest as the principal attraction rather than replacing or substantially modifying it. The concept is therefore based on the principle of a **"forest-led destination"**, in which the built components are sensitively integrated into the existing forest environment.

The architectural concept adopts a **zero-tree-cutting target**, with permanent facilities concentrated primarily within existing clearings and forested sections retained as part of the visitor experience. Raised structures and boardwalks are proposed to minimize ground disturbance, protect tree root systems and reduce interference with natural drainage and soil processes. The project is intended to demonstrate that appropriately planned ecotourism can provide educational, recreational and economic opportunities while supporting conservation of a gazette forest ecosystem. The development will also provide community benefits through local employment, opportunities for local curio-shop operators, skills development and other community-benefit arrangements provided for under the project agreements and license conditions.

Purpose of the Environmental and Social Impact Assessment

Because the proposed development is located within a gazette forest and involves the establishment and operation of tourism facilities, an Environmental and Social Impact Assessment (ESIA) Full Study is being undertaken to identify, predict and evaluate the environmental and social consequences of the proposed project and to establish measures for avoiding, minimizing, mitigating and monitoring potential adverse impacts. The ESIA has been commissioned within the framework established by the Environmental Management and Coordination Act (EMCA), Cap 387, the Environmental (Impact Assessment and Audit) Regulations, 2003, as amended, the Forest Conservation and Management Act, 2016, the conditions of Special Use License No. LIC003/2026, and other applicable legislation and regulatory requirements.

The Terms of Reference for the ESIA were prepared by Econest Consultants Ltd, NEMA EIA/EA Firm of Experts Registration No. 7875, and provide the framework for undertaking the Full Study. The assessment is intended to provide NEMA and other relevant authorities with sufficient information to determine the environmental and social acceptability of the proposed development and to guide environmentally and socially responsible implementation and operation. The ESIA covers the full project lifecycle, including the pre-construction, construction, operational and decommissioning phases. It considers physical, biological, socio-economic and cultural aspects of the project and its zone of influence.

Project Location and Site Characteristics

The proposed development will be undertaken at **Murunya Camp Site within Oloolua Forest Station**, Kajiado County, approximately 4.5 kilometres from Ngong Township. The licensed

development area covers approximately **7.63 acres (3.09 hectares)**. The boundary coordinates provided in the project documentation are in **UTM Zone 37S** as follows:

Table 1: Project Site Co-ordinates

POINT	EASTING	NORTHING
OL1	245312	9848542
OL2	245089	9848466
OL3	245267	9848336
OL4	245403	9848448

The surrounding area includes settlements associated with **Ngong and Ongata Rongai**, together with forest users, community groups and other stakeholders whose interests and livelihoods may interact with the project. For purposes of the ESIA, the baseline assessment will consider the licensed site and a broader zone of influence, including the surrounding forest ecosystem and communities within approximately **3 kilometres** of the project boundary.

Nature and Scope of the Proposed Development

The proposed project is a **low-impact ecotourism facility** comprising complementary educational, recreational, hospitality and conservation-oriented components. The concept masterplan provides indicative accommodation schedules for the principal components. These include a gatehouse and security facility, parking/drop-off area, administration block, museum/interpretation center, restaurant and kitchen, children's play area, five raised cottages, a raised dinosaur trail/boardwalk and a screened service yard. The final locations and dimensions of facilities will be refined following detailed topographical, tree and ecological surveys and the relevant environmental and KFS reviews.

Forest-Sensitive Design Approach

The defining feature of the proposed development is its **low-impact design philosophy**. The masterplan seeks to retain the existing forest as the principal attraction and minimize physical disturbance through the following design principles:

- **Zero Tree-Cutting Approach:** The project has adopted a zero-tree-cutting target. A detailed tree inventory and root-protection assessment will be undertaken before final building positions are confirmed. Existing trees, canopy spread, root protection zones and sensitive habitats will be mapped and incorporated into the final design.

- **Development within Existing Clearings**: Administration, museum, restaurant and parking functions are proposed primarily within existing open or cleared areas where the environmental footprint can be minimized.

- **Elevated Structures:** The cottages and boardwalks will be raised above ground, with the concept proposing micro-piles or screw piles and other suitable low-impact foundation systems to reduce earthworks and avoid major tree-root zones.

- **Elevated Forest Boardwalks:** The dinosaur trail will use raised boardwalks that weave around existing trees rather than requiring the creation of straight cleared corridors through the forest.

- **Permeable Surfaces and Stormwater Management:** Permeable parking surfaces, bioswales and rain gardens are proposed to assist in managing stormwater while reducing erosion and maintaining natural drainage functions.

- **Low-Impact Lighting:** The project proposes dark-sky lighting approaches, including shielded fixtures, low-level lighting and motion-sensitive systems, to minimize unnecessary disturbance

to wildlife and preserve the character of the forest at night.

Project Objectives

The proposed development has interconnected environmental, social, educational and economic objectives. The principal objectives are to:

1. Establish a high-quality ecotourism facility providing educational and recreational experiences within a living forest.

2. Demonstrate low-impact development within a gazetted forest through elevated structures, reversible construction techniques and a strict zero-tree-cutting target.

3. Support forest conservation through establishment of an indigenous tree nursery with a proposed capacity of **500,000 seedlings**.

4. Support rehabilitation of **not less than 15.26 acres of Oloolua Forest**, as required under the project licence.

5. Establish a sustainable model of forest-based tourism that integrates conservation, education and responsible economic activity.

6. Generate local socio-economic benefits through employment, local enterprise opportunities, tourism expenditure and community-benefit arrangements.

7. Provide an immersive educational experience that links the dinosaur theme and interpretation facilities with awareness of present-day forest conservation.

These objectives reflect the project's intended role as a forest conservation and community-benefit initiative supported by compatible ecotourism, rather than a conventional built-up tourism development.

Public Participation and Stakeholder Engagement

Stakeholder engagement and public participation form an integral part of the ESIA process.

The engagement process is designed to ensure that communities, government agencies, forest users, local businesses and other interested parties are adequately informed about the proposed development and are given an opportunity to express their views, concerns and recommendations.

The stakeholder framework identifies three broad categories:

1. **Direct stakeholders and project beneficiaries**, including Empakase Conservation CBO, project staff, contractors and local service providers;

2. **Indirect stakeholders within the project's zone of influence**, including residents and community groups in Ongata Rongai, Ngong and neighboring settlements, community forest associations, local businesses and forest users; and

3. **Regulatory authorities, government lead agencies and relevant NGOs**, including KFS, NEMA, Kajiado County Government, KWS and other institutions with statutory or technical interests in the project.

The ESIA engagement process incorporates formal correspondence, Key Informant Interviews, institutional meetings, public consultation meetings, Focus Group Discussions, direct community liaison and disclosure of relevant project information.

The ESIA has identified a range of potential positive and negative impacts associated with the proposed development. The assessment considers impacts across the entire project lifecycle and distinguishes between direct, indirect, short-term, long-term, reversible and potentially cumulative effects.

Conclusion

The development has been conceived around a conservation-first approach. The principal design commitment is a **zero-tree-cutting target**, supported by elevated structures, raised boardwalks, utilization of existing clearings, root-protection measures and reversible construction methods. The project additionally provides for an indigenous tree nursery with a proposed capacity of **500,000 seedlings** and rehabilitation of not less than **15.26 acres of Oloolua Forest**.

The ESIA has considered the potential environmental and social impacts associated with the project's pre-construction, construction, operational and decommissioning phases. The most important areas requiring continued attention include forest and biodiversity protection, tree-root protection, wildlife disturbance, soil and drainage management, waste and wastewater management, fire risk, visitor safety, occupational health and safety, traffic, resource consumption and community relations. At the same time, the project has potential to generate significant positive outcomes through local employment, local enterprise opportunities, tourism development, environmental education, indigenous tree production, forest rehabilitation and community-benefit arrangements.

The ESIA therefore recommends that implementation of the proposed project proceed only in accordance with the conditions of Special Use Licence No. LIC003/2026, the applicable requirements of NEMA and other regulatory authorities, the approved project design, the ESIA recommendations and the Environmental and Social Management and Monitoring Plan.

CHAPTER ONE

1 INTRODUCTION AND PROJECT OBJECTIVES

1.1 Introduction

Empakase Conservation Community Based Organisation (CBO), hereinafter referred to as **the Proponent**, proposes to develop a **Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County**. The proposed development is situated within **Oloolua Forest Station**, a gazetted forest under the management of the Kenya Forest Service (KFS), and is intended to establish an integrated conservation, environmental education, recreation and hospitality destination within an existing forest environment. The proposed development will occupy approximately **7.63 acres (3.09 hectares)** within the licensed area. The project is authorised under **Special Use Licence No. LIC003/2026**, issued by the Kenya Forest Service on **30 March 2026**. The development will comprise a number of complementary low-impact ecotourism and visitor-support facilities, including a robotic dinosaur theme park, museum and interpretation centre, eco-restaurant and kitchen, raised tented eco-cottages, children's recreational facilities, picnic areas, eco-toilets, administration and ticketing facilities, parking and drop-off areas, nature and dinosaur trails, associated utility infrastructure and an indigenous tree nursery.

The project is conceived as a **forest-led ecotourism development**, in which the existing Oloolua Forest remains the principal environmental and recreational asset. The proposed facilities are therefore intended to be integrated into the existing landscape while minimizing disturbance to trees, soil, drainage systems, wildlife habitats and other ecological features. The proposed development is expected to provide environmental, educational, social and economic benefits. These include employment and enterprise opportunities for local communities, environmental awareness, visitor education, increased tourism activity, indigenous tree propagation, forest rehabilitation and community-benefit arrangements. At the same time, the location of the project within a gazetted forest means that its implementation must be undertaken with particular emphasis on ecological protection, visitor management, fire prevention, biodiversity conservation and sustainable use of natural resources.

The project will therefore be implemented in accordance with the applicable environmental and social safeguards, the conditions of the Special Use license, the requirements of the National Environment Management Authority (NEMA), Kenya Forest Service requirements and other applicable statutory approvals and regulatory conditions.

1.2 Background and Rational of the ESIA

Environmental and Social Impact Assessment is an important planning and decision-making tool for ensuring that environmental and social considerations are incorporated into the design and implementation of development projects. It enables potential adverse impacts to be identified and addressed before they become significant and provides a framework for enhancing positive environmental and socio-economic outcomes. The proposed Empakase ecotourism facility is located within a **gazette forest ecosystem** and will introduce visitor, hospitality, recreational and associated infrastructure into an environmentally sensitive setting. Consequently, there is a need to carefully assess the interaction between the proposed development and the existing forest environment throughout the project life cycle.

The ESIA has therefore been undertaken to establish the existing environmental and socio-economic conditions of the project area, identify potential impacts associated with the proposed development, assess the significance of those impacts and develop appropriate measures for avoiding, minimizing, mitigating or managing adverse effects while enhancing positive impacts. The assessment is undertaken within the framework of the **Environmental Management and Coordination Act (EMCA), Cap 387**, the **Environmental (Impact Assessment and Audit) Regulations, 2003, as amended**, the **Forest Conservation and Management Act, 2016**, and other applicable national and county legislation, policies, regulations, standards and institutional requirements.

1.3 Purpose of the Study

The overall purpose of this ESIA Study is to assess the potential environmental and social implications of the proposed Low-Impact Ecotourism Facility at Murunya Camp Site and to establish appropriate measures for ensuring that the project is implemented and operated in an environmentally and socially responsible manner. More specifically, the study seeks to:

- establish and document the existing environmental and socio-economic baseline conditions of the project area and its zone of influence;
- describe the proposed development and its associated activities and infrastructure;
- identify potential positive and adverse environmental and social impacts associated with the project;
- assess the significance, duration, extent, reversibility and cumulative nature of identified impacts where applicable;
- evaluate reasonable project alternatives, including alternative layouts, technologies and the No-Project Alternative;
- identify measures for avoiding, minimizing, mitigating or managing adverse impacts;
- identify opportunities for enhancing the project's positive environmental and socio-economic benefits;
- incorporate stakeholder and community views and concerns into project planning and environmental management;
- establish appropriate environmental, health, safety and social safeguards;
- develop an Environmental and Social Management and Monitoring Plan (ESMMP) for implementation throughout the project life cycle; and
- provide NEMA, KFS and other relevant authorities with adequate information to support informed decision-making regarding the proposed development.

1.4 Terms of Reference

The Terms of Reference (TOR) for the ESIA Full Study were prepared to guide the assessment of the proposed Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest. The TOR establish the scope and methodology for assessing the environmental and social implications of the proposed development and require consideration of the project description, baseline environmental and socio-economic conditions, legal and institutional framework, stakeholder engagement, impact identification and assessment, alternatives, mitigation measures, environmental and social management and monitoring, emergency preparedness, occupational health and safety and decommissioning.

The TOR therefore provide the principal framework for preparation of this ESIA Study Report and have been used to guide the assessment and organization of the study findings. The assessment also takes into account the requirements and obligations arising from **Special Use Licence No. LIC003/2026**, particularly those relating to development and operation within Oloolua Forest, forest conservation, community benefits and implementation of the approved project activities.

1.5 Study Methodology

The ESIA was undertaken using a combination of field investigations, review of project documentation, stakeholder engagement, environmental and social assessment techniques and professional interpretation of

the information collected. The methodology was designed to ensure that the assessment was sufficiently broad to address the requirements of the approved TOR while remaining focused on the environmental and social sensitivities of the proposed development.

1.5.1 Review of Project Documentation

Available project documentation was reviewed to establish the nature, scope and proposed implementation of the development. The principal project reference documents include the project concept/masterplan, the Investor Agreement and associated Special Use license documentation, and the approved Terms of Reference for the ESIA. The project documentation was used to establish the proposed project components, development philosophy, site requirements, implementation approach, conservation commitments and community-benefit provisions.

1.5.2 Site Reconnaissance and Field Observations

Site visits and reconnaissance surveys were undertaken to obtain first-hand information on the existing conditions of the proposed project area. Field observations focused on the physical and biological characteristics of the site, existing vegetation and trees, forest condition, access, drainage, land use, surrounding developments, sensitive areas and other features that could influence project design or environmental performance. Photographic documentation was undertaken to supplement field observations and provide a visual record of existing site conditions.

1.5.3 Environmental and Social Baseline Assessment

The baseline assessment involved characterization of the existing physical, biological and socio-economic environment within the project site and relevant area of influence. The assessment provides the basis against which potential changes resulting from project implementation can be identified and evaluated. Where appropriate, information from secondary sources was reviewed and compared with field observations to strengthen the understanding of existing environmental and social conditions.

1.5.4 Stakeholder Engagement and Public Participation

Stakeholder engagement was undertaken to obtain information and views from institutions, communities and other parties with an interest in or potentially affected by the proposed development. The engagement process sought to:

- provide information on the proposed project;
- identify community and stakeholder concerns;
- obtain local knowledge relevant to environmental and social conditions;
- identify potential impacts that may not be apparent from technical investigations alone; and
- obtain recommendations for mitigation and enhancement measures.

The stakeholder engagement process also considered the need for inclusive participation, including participation by potentially vulnerable or marginalized groups.

1.5.5 Legal and Institutional Review

Relevant national legislation, regulations, policies, standards and institutional requirements were reviewed to establish the legal and regulatory framework applicable to the proposed project. Particular emphasis was placed on requirements relating to environmental management, forest conservation, biodiversity, water resources, waste management, air quality, noise and vibration, occupational health and safety, public health,

land-use planning, tourism and community participation. The conditions of the KFS Special Use License were also considered in assessing the project's environmental and institutional obligations.

1.5.6 Impact Identification and Assessment

Potential environmental and social impacts were identified through field observations, review of project activities, consultations, analysis of the baseline environment and professional assessment. The assessment considered impacts arising during:

1. pre-construction;
2. construction;
3. operation; and
4. decommissioning.

Both positive and adverse impacts were assessed. The assessment considered the nature and significance of impacts, including their magnitude, extent, duration, likelihood, reversibility and potential cumulative implications where applicable. Particular consideration was given to the interaction between increased human activity and the ecological sensitivity of Oloolua Forest.

1.5.7 Development of Mitigation and Enhancement Measures

For each significant adverse impact identified, appropriate mitigation measures were developed in accordance with the mitigation hierarchy, with preference given to avoiding impacts at source, followed by minimization, restoration and, where necessary, other appropriate management measures. Enhancement measures were also identified for positive impacts, particularly those relating to employment, community participation, environmental education, forest restoration, indigenous tree propagation and conservation awareness.

1.5.8 Alternatives Analysis

Alternative project options were considered to establish whether the intended project objectives could be achieved through approaches that would result in lower environmental and social impacts. The alternatives considered include project layout and siting within the licensed area, construction approaches, technology and utility options, project phasing and the No-Project Alternative.

1.5.9 Preparation of the ESMMP

The findings of the assessment were used to develop an Environmental and Social Management and Monitoring Plan. The ESMMP translates the recommendations of the ESIA into implementable actions and establishes responsibilities, monitoring requirements, performance indicators, implementation periods and indicative costs. The ESMMP is intended to remain a practical management tool throughout project implementation and operation and will be updated where necessary in response to monitoring results, regulatory requirements and changes in project activities.

1.6 Structure of the ESIA Study Report

This ESIA Study Report is organized into chapters addressing the principal requirements of the environmental and social assessment process. The report broadly covers:

- introduction and scope of the study;
- description of the proposed project;

- policy, legal and institutional framework;
- description of the existing environmental and socio-economic conditions;
- stakeholder engagement and public participation;
- analysis of project alternatives;
- identification and assessment of anticipated environmental and social impacts;
- mitigation and enhancement measures;
- environmental and social management and monitoring requirements;
- emergency preparedness and response;
- occupational health, safety and community health considerations;
- conclusions and recommendations; and
- supporting references, maps, photographs, consultation records and other appendices.

The organization of the report is intended to provide a logical progression from **project description and baseline conditions, through stakeholder concerns and alternatives, to impact assessment, mitigation and environmental and social management**.

1.7 Key Environmental and Social Considerations

Given the location and nature of the proposed development, the ESIA gives particular attention to the following key considerations:

- ✓ **Forest and tree conservation:** The project is located within Oloolua Forest and therefore requires strict control of vegetation disturbance. The proposed zero-tree-cutting target and tree/root-protection measures form an important component of the environmental management approach.

- ✓ **Biodiversity and wildlife:** Construction and increased visitor activity have the potential to disturb wildlife and habitats. The assessment therefore considers habitat sensitivity, wildlife movement, lighting, noise, visitor behaviour and other potential disturbance pathways.

- ✓ **Soil and drainage:** Construction and visitor infrastructure may alter soil surfaces and drainage patterns. The project concept therefore incorporates low-impact foundations, permeable surfaces and natural stormwater-management approaches.

- ✓ **Waste and wastewater:** The generation and management of solid waste and wastewater during construction and operation will require appropriate systems to prevent pollution and maintain environmental health.

- ✓ **Fire risk:** The location within a forest environment creates an important fire-management consideration. Prevention, preparedness, detection, response and emergency coordination will therefore form part of the project's environmental and safety management framework.

- ✓ **Visitor and worker safety:** The project will receive visitors within a forest environment and will employ personnel for construction and operation. Appropriate occupational health, safety and visitor-management measures will therefore be required.

- ✓ **Community participation and benefits:** The project has potential to create employment, enterprise and other community benefits. Meaningful stakeholder engagement and transparent implementation of community-benefit arrangements will be important to maintaining positive local relationships.

- ✓ **Forest rehabilitation and conservation education:** The proposed indigenous tree nursery and forest rehabilitation activities provide opportunities for the project to contribute positively to conservation and environmental awareness.

CHAPTER TWO

2 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 Introduction

The project is of particular environmental significance because it is situated within a gazetted forest ecosystem and is intended to provide a low-impact ecotourism facility within a natural forest setting. The development therefore requires a regulatory approach that gives priority to the conservation of forest resources, biodiversity and ecological functions while allowing compatible recreational and tourism activities. The project's implementation must consequently be consistent with the conditions of the Kenya Forest Service Special Use Licence No. LIC003/2026 issued on 30 March 2026, the Environmental and Social Impact Assessment requirements administered by the National Environment Management Authority (NEMA), and all other applicable statutory approvals.

The legal and institutional framework has therefore been reviewed from a project-specific perspective. The assessment considers not only legislation governing environmental impact assessment, but also the specific legal requirements applicable to forest land, special-use authorisations, biodiversity, wildlife, tourism, land-use planning, construction, water resources, public health, occupational safety, waste management and community participation.

The framework presented in this chapter provides the basis against which the proposed development has been assessed. It also establishes the legal obligations that shall continue to apply throughout the project lifecycle, including planning, pre-construction, construction, operation, environmental monitoring, environmental auditing and eventual decommissioning.

For purposes of this ESIA, a project is considered **"Compliant"** where the relevant requirement has already been satisfied based on the information available for the project; **"Conditionally Compliant"** where an approval, permit, certification or action remains to be completed before the relevant activity can lawfully commence; and **"Ongoing Compliance"** where compliance is a continuing operational obligation.

2.2 Constitutional Framework

2.2.1 Constitution of Kenya, 2010

The Constitution of Kenya, 2010 provides the supreme legal foundation for environmental governance in Kenya. Article 42 guarantees every person the right to a clean and healthy environment, including the right to have the environment protected for the benefit of present and future generations. Article 69 places obligations on the State to ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, while also requiring measures for the protection of the environment and the elimination of processes and activities likely to endanger it. The Constitution further recognizes public participation, sustainable development, access to information, equality and protection of property rights as important principles of governance.

These constitutional provisions are directly relevant to Empakase because the project is proposed within a gazetted forest ecosystem where environmental conservation must remain an integral part of development planning. The project design and implementation shall therefore prioritize avoidance of unnecessary vegetation clearance, protection of biodiversity, responsible use of forest resources, prevention of pollution, proper waste and wastewater management, occupational and visitor safety, stakeholder participation and equitable community benefits. The constitutional principle of sustainable development is particularly important to the project because the intended ecotourism use must not compromise the ecological functions of Oloolua Forest or the ability of future generations to benefit from its environmental, recreational and socio-economic resources.

Compliance status: Compliant – ongoing. *The ESIA process, environmental management measures, public participation process and proposed conservation measures are intended to operationalize the constitutional environmental obligations. Continued compliance will be required throughout the project lifecycle.*

2.3 Environmental Management and Coordination Framework

2.3.1 Environmental Management and Co-ordination Act, 1999, as amended

The **Environmental Management and Co-ordination Act, 1999 (EMCA)** is the principal framework environmental legislation in Kenya. It establishes NEMA as the principal government institution responsible for general supervision and coordination of environmental matters and implementation of environmental policy. EMCA establishes the legal foundation for environmental impact assessment, environmental auditing, environmental monitoring, pollution control, environmental standards, restoration and enforcement. NEMA confirms that projects likely to have negative environmental impacts or projects for which an EIA is required should not commence without the applicable environmental assessment and approval.

Empakase falls within a particularly sensitive category because it involves development within a forest ecosystem and may affect vegetation, wildlife habitats, soils, drainage, water resources, landscape character and community use of forest resources. The Proponent is therefore required to undertake the applicable environmental assessment process, obtain the necessary environmental approval from NEMA and implement the approved Environmental and Social Management and Monitoring Plan. The Proponent shall also comply with all conditions attached to the NEMA environmental approval and shall undertake environmental monitoring and auditing as required by law and the conditions of approval.

Compliance status: Ongoing / Conditional upon NEMA approval. *The ESIA has been prepared to facilitate regulatory review. The Proponent shall not commence regulated project activities requiring prior environmental approval before obtaining the applicable NEMA approval/license.*

2.3.2 Environmental (Impact Assessment and Audit) Regulations, 2003, as amended

The Environmental (Impact Assessment and Audit) Regulations establish the procedural framework for undertaking environmental impact assessment and environmental audits in Kenya. NEMA confirms that EIA is a preventive environmental-management tool and that assessment is required before commencement of projects subject to EIA requirements. The Regulations also provide for stakeholder participation, consideration of alternatives, impact assessment, mitigation measures and environmental management planning.

The 2019 amendments introduced the risk-based approach and mechanisms for environmental assessment of low- and medium-risk projects, including the Summary Project Report and Comprehensive Project Report processes where applicable. NEMA continues to administer environmental assessment and licensing under the amended framework. For Empakase CBO Proposed project, the ESIA process provides the mechanism for identifying and managing impacts associated with construction within a forest environment, visitor activities, vegetation disturbance, waste, wastewater, noise, fire risk, occupational safety, biodiversity and community interactions.

The Proponent shall ensure that the final project design, implementation and operation remain consistent with the approved ESIA and environmental management plan. Any material change to the project that may alter its environmental impacts shall be subjected to the applicable regulatory review.

Compliance status: Ongoing / Conditional. *Compliance is being pursued through the present ESIA process and shall continue through implementation, environmental monitoring and environmental auditing*.

2.4 Forest Conservation and Management Framework

2.4.1 Forest Conservation and Management Act, 2016

The **Forest Conservation and Management Act, 2016** is the principal legislation governing conservation, protection, management and sustainable utilization of forest resources in Kenya. The Act gives effect to Article 69 of the Constitution and establishes the Kenya Forest Service (KFS) as the institution responsible for the management and conservation of public forests under its jurisdiction. The Act provides for various forms of authorization for activities within forests, including permits, special use licenses, contracts, joint management agreements and concessions.

The Act is the most directly relevant sectoral legislation for Empakase CBO proposed low impact ecolodge and associated amenities because the project is proposed within a gazetted forest and its implementation is dependent upon a KFS authorization. The project shall therefore be undertaken strictly within the geographical boundaries, approved activities, conditions and duration specified in **Special Use Licence No. LIC003/2026 issued by Kenya Forest Service on 30 March 2026**. The Proponent shall not undertake additional construction, vegetation clearance, infrastructure development, commercial exploitation of forest resources or other forest-related activities outside the scope of the KFS authorization without obtaining the necessary approval. The forest environment shall be treated as the primary ecological receptor. Development shall be confined to the approved footprint, unnecessary removal of trees and other vegetation shall be avoided, and any unavoidable disturbance shall be subject to appropriate restoration and compensatory measures agreed with KFS and other relevant authorities. The Proponent shall also cooperate with KFS in forest protection, fire prevention, biodiversity conservation, visitor management and monitoring of environmental performance.

Compliance status: Compliant subject to license conditions / ongoing. *The project has a KFS Special Use Licence No. LIC003/2026. Continued compliance requires strict adherence to the licence conditions, approved project footprint and all applicable requirements of the Forest Conservation and Management Act.*

2.4.2 National Forest Policy, 2023

The National Forest Policy, 2023 provides the current national policy framework for sustainable forest management, conservation, restoration and utilization of forest resources. The State Department for Forestry identifies the National Forest Policy 2023 among its current policy and strategy documents. The policy promotes sustainable management of forest ecosystems, conservation of biodiversity, restoration of degraded forests, community participation and responsible utilization of forest resources. The policy is directly relevant to Empakase because the proposed ecotourism facility seeks to derive recreational and economic value from a forest environment while maintaining the ecological integrity of the forest. The development shall therefore adopt a low-impact approach, minimize vegetation disturbance, promote environmental awareness among visitors, prevent pollution and support forest conservation. Where feasible, the project shall support forest restoration, indigenous tree planting, environmental education and community participation in conservation initiatives.

Compliance status: Consistent / ongoing. *The proposed ecotourism concept is consistent with sustainable utilization of forest resources, subject to strict implementation of conservation measures and KFS conditions.*

2.5 Biodiversity and Wildlife Conservation Framework

2.5.1 Wildlife Conservation and Management Act, 2013, as amended

The **Wildlife Conservation and Management Act, 2013**, as amended, provides the legal framework for protection, conservation and sustainable management of wildlife in Kenya. The current version was

amended by the Wildlife Conservation and Management (Amendment) Act, 2025. The Act applies to wildlife resources on public, community and private land. The Act is relevant to Empakase because forest ecosystems provide habitat for wildlife, including birds, mammals, reptiles, insects and other fauna. Ecotourism activities must therefore be undertaken in a manner that does not unnecessarily disturb, injure, capture, kill or otherwise interfere with wildlife or wildlife habitats. The Proponent shall prohibit hunting, trapping, feeding or harassment of wildlife by visitors, workers or contractors. Lighting, noise, waste, vegetation clearance and other activities shall be managed to minimize disturbance to wildlife. Any wildlife-related incident shall be reported and managed in consultation with the appropriate authority.

Compliance status: Compliant subject to ongoing implementation. *No wildlife exploitation is proposed. Continued compliance shall be demonstrated through visitor controls, biodiversity conservation measures and incident-management procedures.*

2.5.2 Biodiversity Conservation

The project shall apply the principles of biodiversity conservation by avoiding unnecessary destruction or fragmentation of habitat and by maintaining the ecological character of the surrounding forest. Landscape and restoration measures shall, where possible, favour indigenous and ecologically appropriate species. Invasive species shall not be introduced through landscaping or other project activities. The Proponent shall ensure that construction workers and visitors receive appropriate environmental awareness concerning wildlife, vegetation, fire prevention, waste management and prohibited activities within the forest.

Compliance status: Conditional / ongoing. *Biodiversity protection measures shall be incorporated into the ESMP, construction procedures and operational visitor-management systems.*

2.6 Sustainable Tourism and Ecotourism Framework

2.6.1 Tourism Act, 2011, as amended

The **Tourism Act, 2011**, as amended, provides the principal statutory framework for development, management, marketing and regulation of sustainable tourism and tourism-related activities and services in Kenya. The Act expressly recognizes ecotourism as responsible travel to natural areas undertaken without disturbing their ecological, economic or cultural status and recognizes sustainable tourism as tourism development that protects opportunities for the future. The Act establishes the Tourism Regulatory Authority (TRA), which is responsible for regulation of tourism enterprises and services falling within the statutory framework. Empakase is intended to operate as an ecotourism facility and shall therefore ensure that the scale, design and operation of the facility remain compatible with the ecological character of Oloolua Forest. The facility shall implement responsible visitor management, environmental interpretation, waste minimization, water conservation, energy efficiency and appropriate community-benefit measures. The Proponent shall obtain the applicable tourism-sector licenses, registrations and approvals required for the specific tourism activities and facilities to be operated at the site.

Compliance status: Conditional. *The project concept is consistent with the statutory principles of sustainable tourism and ecotourism. All applicable TRA and tourism-sector licensing requirements shall be fulfilled before commencement of regulated tourism operations.*

2.7 Land-Use Planning and Development Control

2.7.1 Physical and Land Use Planning Act, 2019

The Physical and Land Use Planning Act, 2019 establishes the framework for physical and land-use planning and development control in Kenya. Section 57 provides that a person shall not undertake development within a county without development permission from the respective county government. The proposed Empakase facility shall therefore be implemented in accordance with the applicable land-use

planning requirements of the **County Government of Kajiado**, together with the requirements of KFS arising from the site's forest status. The development permission process shall take account of the proposed land use, site access, building footprint, infrastructure, drainage, sanitation, fire safety, parking, environmental sensitivity and compatibility with surrounding land uses. No expansion beyond the approved footprint shall be undertaken without the necessary planning and environmental approvals.

Compliance status: Conditional. *Applicable development permission and county planning approvals shall be obtained and maintained before commencement of the relevant development activities*.

2.7.2 Land Act, 2012 and Applicable Land Rights

The Land Act provides the framework for administration and management of land in Kenya. For Empakase, land-use rights must be considered together with the legal status of the forest and the KFS Special Use Licence. The Proponent shall ensure that the project remains within the area lawfully authorized for the proposed use and that no occupation, construction or utilization of land outside the approved area occurs. Any easements, access arrangements, wayleaves or other third-party rights affecting the development shall be respected.

Compliance status: Compliant subject to continued verification. *The project is supported by a KFS Special Use License; compliance shall depend upon continued adherence to the license and other land-use authorizations.*

2.8 Water Resources and Water Supply

2.8.1 Water Act, 2016

The Water Act, 2016 provides the principal framework for management, conservation, control and regulation of water resources in Kenya. The Act is relevant to Empakase because the facility will require water for domestic, sanitation, cleaning, landscaping and hospitality purposes. The Proponent shall ensure that any abstraction, storage, treatment or use of water is undertaken lawfully and sustainably. Where groundwater or another regulated water source is proposed, the appropriate authorization shall be obtained from the **Water Resources Authority (WRA)** and all conditions relating to abstraction, water conservation and monitoring shall be observed. The project shall promote water efficiency through appropriate fixtures, leak detection, rainwater harvesting where feasible and responsible water-use practices.

Compliance status: Conditional / ongoing. *Any required WRA authorization shall be obtained before abstraction from a regulated water resource.*

2.8.2 Water Resources Regulations, 2021

The Water Resources Regulations, 2021 provide the regulatory framework for management, use and development of water resources. The Regulations apply to all water resources and provide the basis for water-resource authorizations and related controls. The Proponent shall comply with applicable WRA requirements concerning water abstraction, protection of water resources, water conservation, monitoring and reporting. No activity associated with the project shall result in contamination of groundwater, surface water or drainage systems.

Compliance status: Conditional / ongoing. *Compliance shall be demonstrated through acquisition and maintenance of applicable WRA authorizations and implementation of water-resource protection measures.*

2.8.3 Environmental Management and Co-ordination (Water Quality) Regulations, 2024, as amended

The **Environmental Management and Co-ordination (Water Quality) Regulations, 2024** are the current principal EMCA regulations governing water quality and effluent management. They replaced the earlier

2006 framework and have subsequently been amended in 2025. NEMA confirms that the 2024 Regulations apply to domestic, industrial, agricultural, recreational, fisheries and wildlife uses of water and provide for protection of lakes, rivers, streams, springs, wells and other water sources. The Regulations prohibit activities that directly or indirectly cause water pollution and require a valid effluent discharge license for discharge of effluent from sewage treatment works or other point sources into the environment. Empakase shall therefore provide an appropriate wastewater management system suited to the scale and nature of the proposed ecotourism facility. Sewage and wastewater shall not be discharged untreated onto the forest floor, into drainage channels or into any water resource. Where treated effluent is discharged to the environment, the Proponent shall obtain the applicable NEMA effluent discharge license and demonstrate compliance with the prescribed effluent standards.

Compliance status: Conditional / high priority. *Wastewater management infrastructure shall be properly designed, commissioned and maintained, with any applicable effluent discharge license obtained before discharge occurs.*

2.9 Waste Management Framework

2.9.1 Sustainable Waste Management Act, 2022

The Sustainable Waste Management Act, 2022 establishes the legal and institutional framework for sustainable waste management in Kenya. It promotes waste prevention, reduction, reuse, recycling, recovery, resource efficiency and environmentally sound disposal. The Act is particularly relevant to Empakase because tourism and hospitality operations generate food waste, packaging, plastics, glass, paper, sewage sludge, maintenance wastes and potentially hazardous wastes. The Proponent shall implement waste minimization and source segregation and shall ensure that recyclable, organic, residual and hazardous waste streams are appropriately managed. Waste shall only be transferred to authorized waste handlers and facilities. The ecotourism character of the project shall be reflected in its waste-management system by prioritizing reduction, reuse, recycling and recovery rather than disposal.

Compliance status: Conditional / ongoing. *A site-specific waste-management system shall be established and maintained during construction and operation.*

2.9.2 Environmental Management and Co-ordination (Waste Management) Regulations, 2024, as amended

The Environmental Management and Co-ordination (Waste Management) Regulations, 2024 provide the current EMCA framework governing handling, storage, transportation, segregation, treatment and disposal of waste. The Regulations commenced in November 2024 and were subsequently amended in 2025. The Regulations place responsibilities on waste generators and provide requirements concerning segregation, transportation, waste disposal sites, hazardous waste and waste-management records. Construction waste, food waste, packaging, plastics, maintenance waste and any hazardous waste generated by Empakase shall therefore be managed through approved systems. Waste shall not be buried, burned in the open, dumped within the forest or disposed of in drainage systems.

Compliance status: Conditional / ongoing. *Compliance shall be demonstrated through segregation, storage, documentation and use of appropriately authorized waste service providers*.

2.9.3 Plastic Packaging Management

The Environmental Management and Co-ordination (Management and Control of Plastic Packaging Materials) Regulations, 2024 establish controls over plastic carrier bags, plastic packaging materials and related activities. The project shall minimize unnecessary single-use plastics and ensure that any plastic packaging used within the facility is managed in accordance with applicable requirements. Procurement policies shall favor reusable or recyclable alternatives wherever practicable.

Compliance status: Conditional / ongoing.

2.9.4 Environmental Management and Co-ordination (Air Quality) Regulations, 2024, as amended

The Environmental Management and Co-ordination (Air Quality) Regulations, 2024 provide the current framework for prevention, control and abatement of air pollution. The Regulations address ambient air quality, emissions, particulate matter, fugitive emissions and stationery and mobile sources. During construction, potential air-quality impacts may arise from vegetation clearance, earthworks, excavation, vehicle movement, transportation and handling of construction materials. During operation, potential sources may include vehicles, generators, kitchen equipment and other combustion sources. The Proponent and contractors shall control dust, maintain machinery, minimize unnecessary idling, cover transported materials and avoid open burning of waste. Generators and other emission sources shall be properly maintained and operated in accordance with applicable standards.

Compliance status: Conditional / ongoing.

2.9.5 Environmental Management and Co-ordination (Noise and Excessive Vibration Pollution Control) Regulations, 2009

The Noise and Excessive Vibration Pollution Control Regulations provide requirements for prevention and control of excessive noise and vibration. Construction activities covered by the Regulations include earth-moving, landscaping, excavation, concreting and installation works. The forest environment and the presence of wildlife make noise management particularly important for Empakase. Construction activities shall therefore be planned to minimize unnecessary disturbance, and noisy equipment shall be properly maintained. Operational activities, including music, events, generators, vehicles and visitor activities, shall be managed to prevent excessive noise and disturbance to neighbouring communities and wildlife.

Compliance status: Conditional / ongoing.

2.10 Occupational Health and Safety Framework

2.10.1 Occupational Safety and Health Act, 2007

The Occupational Safety and Health Act, 2007 provides for the safety, health and welfare of workers and other persons lawfully present at workplaces. The Act applies to both construction and operation of the Empakase facility. Construction hazards may include working at height, excavation, lifting operations, electrical works, machinery, manual handling, dust, noise, fire and vehicle movement. Operational hazards may include kitchen operations, electrical systems, slips and falls, fire, chemicals, maintenance activities and visitor-related emergencies. The Proponent and contractors shall establish safe systems of work, undertake workplace risk assessments, provide appropriate PPE, train workers, maintain emergency procedures, provide first-aid arrangements and report workplace accidents and incidents as required.

Compliance status: Conditional / ongoing. *A documented occupational health and safety management system shall be operational during construction and maintained throughout the operational phase*.

2.10.2 Occupational Safety and Health Subsidiary Rules

Applicable occupational safety and health subsidiary legislation concerning first aid, safety and health committees, medical examination and other workplace requirements shall be implemented according to the size and nature of the workforce and the hazards present. Workers exposed to particular occupational risks shall receive appropriate training, protective equipment, medical surveillance and emergency support.

Compliance status: Conditional / ongoing.

2.10.3 Work Injury Benefits Act, 2007

The Work Injury Benefits Act provides for compensation to employees for work-related injuries and occupational diseases. The Proponent and all contractors shall ensure that employees are covered in accordance with the Act and that occupational injuries and diseases are reported and managed through the prescribed procedures.

Compliance status: Conditional / ongoing. Appropriate insurance, reporting and compensation arrangements shall be maintained throughout construction and operation.

2.10.4 Fire Risk Reduction Requirements

Fire is a particularly important risk for Empakase because the facility will operate within a forest environment where uncontrolled fire could cause significant ecological, property and safety impacts. The project shall incorporate fire prevention, detection and response measures appropriate to the facility. Fire extinguishers, alarms, emergency access, evacuation routes, assembly points, emergency lighting and appropriate water supplies shall be provided as required by the approved design and applicable law. The Proponent shall also establish a forest-fire prevention and emergency response protocol in consultation with KFS and other relevant emergency-response agencies. Smoking, uncontrolled fires, outdoor burning and other activities capable of initiating forest fires shall be strictly controlled.

Compliance status: Conditional / high priority. *Fire-safety systems and emergency procedures shall be approved, installed, tested and maintained before occupation and operation*.

2.10.5 Public Health Act, Cap. 242

The Public Health Act provides for protection of public health and prevention of nuisances and conditions likely to endanger human health. It prohibits activities that create public-health nuisances and addresses sanitation, water supply, waste, drainage and environmental hygiene. The Empakase facility shall provide adequate sanitation, potable water, drainage, wastewater management, waste storage, food hygiene and pest-control measures. Particular attention shall be given to kitchens, food storage, accommodation areas, toilets, wastewater facilities and waste-storage areas.

Compliance status: Conditional / ongoing.

2.11 Construction Regulation

2.11.1 National Construction Authority Act and Regulations

Construction activities shall be undertaken in accordance with the National Construction Authority framework. The Proponent shall ensure that the contractor and relevant professionals possess the appropriate qualifications, registration and approvals. Construction activities shall be supervised by competent professionals and shall comply with applicable environmental, structural, occupational health and safety requirements.

Compliance status: Conditional. *Contractor registration, project registration and other applicable NCA requirements shall be satisfied before construction*.

2.11.2 National Building Code, 2024

The **National Building Code, 2024**, published under Legal Notice No. 47 of 2024, replaced the former Local Government (Adoptive By-Laws) (Building) Order of 1968 and came into force on 1 March 2025. The Code establishes requirements for planning, design, construction, building services, structural safety, accessibility, fire safety, quality, maintenance and demolition. Empakase shall therefore be designed and constructed in accordance with the applicable requirements of the National Building Code, including structural integrity, fire safety, accessibility, sanitation, ventilation, electrical installations, emergency escape and building maintenance.

Compliance status: Conditional. *Approved architectural, structural and services designs and all applicable county and statutory approvals shall be obtained before construction*.

2.12 Climate Change and Climate Resilience

2.12.1 Climate Change Act, 2016, as amended

The Climate Change Act, 2016, as amended, provides Kenya's legal framework for enhanced response to climate change and low-carbon, climate-resilient development. The current version incorporates amendments made in 2023. Empakase shall integrate climate resilience into project design and operation through water conservation, efficient energy use, appropriate stormwater management, fire-risk management, protection of forest vegetation and use of climate-resilient infrastructure. The forest setting also provides an opportunity to support carbon sequestration and ecosystem resilience through conservation of existing vegetation and restoration of disturbed areas.

Compliance status: Compliant subject to implementation / ongoing.

2.12.2 National Climate Change Action Plan 2023–2027

Kenya's National Climate Change Action Plan 2023–2027 provides priority adaptation and mitigation actions towards low-carbon, climate-resilient development and recognizes tourism, wildlife, water and other climate-sensitive sectors as important areas for climate action. The project shall align with these objectives through energy efficiency, water conservation, sustainable waste management, forest conservation, climate-sensitive design and awareness of climate-related risks.

Compliance status: Consistent / ongoing.

2.13 National Museums and Heritage Act, 2006

The National Museums and Heritage Act provides for identification, protection, conservation and transmission of Kenya's cultural and natural heritage. Although no known archaeological or cultural heritage site is identified as being directly affected by the proposed development based on the information currently available, construction activities shall incorporate a chance-find procedure. If archaeological artefacts, human remains, fossils, culturally significant objects or other materials of potential heritage value are encountered, work in the immediate area shall cease and the matter shall be reported to the relevant authority for assessment and direction.

Compliance status: Compliant subject to implementation of a chance-find procedure.

2.14 International Environmental Conventions

Kenya is party to a number of international environmental agreements whose principles are reflected in national environmental and natural-resource legislation.

2.14.1 Convention on Biological Diversity

The Convention on Biological Diversity promotes conservation of biological diversity, sustainable use of its components and equitable sharing of benefits arising from genetic resources. Its principles are relevant to Empakase because the project is located within a forest ecosystem. The Proponent shall therefore prioritize biodiversity conservation, habitat protection, sustainable use and prevention of unnecessary disturbance.

Compliance status: Applicable through national legislation and project conservation measures.

2.14.2 United Nations Framework Convention on Climate Change and Paris Agreement

The UNFCCC and Paris Agreement provide the international framework for climate-change mitigation, adaptation and resilience. Their objectives are reflected in Kenya's Climate Change Act and National Climate Change Action Plan. Empakase shall contribute to these objectives through forest conservation, resource efficiency, low-carbon practices, climate-resilient infrastructure and sustainable tourism.

Compliance status: Applicable through national climate legislation and project measures.

2.14.3 Ramsar Convention

The Ramsar Convention provides the international framework for conservation and wise use of wetlands. While the project is primarily a forest-based ecotourism development, the principles of ecosystem conservation and protection of water-dependent habitats remain relevant where project activities interact with wetlands, streams or other aquatic ecosystems.

Compliance status: Applicable where relevant through national environmental and water-resource legislation.

Table 2:Consolidated Legal and Regulatory Compliance Register

Legal / Policy Instrument	**Principal Project Obligation**	**Responsible Authority / Institution**	**Compliance Status**
Constitution of Kenya, 2010	Environmental protection, sustainable development, public participation and community rights	NEMA / Courts / Government agencies	Compliant – Ongoing
EMCA, 1999, as amended	Environmental assessment, licensing, monitoring and environmental protection	NEMA	Ongoing / Conditional
Environmental (Impact Assessment and Audit) Regulations, 2003, as amended	ESIA, stakeholder participation, environmental licensing and auditing	NEMA	Ongoing / Conditional
Forest Conservation and Management Act, 2016	Conservation and lawful utilization of forest resources	KFS	Compliant subject to license conditions
KFS Special Use license No. LIC003/2026	Authorized use of the approved forest area and compliance with license conditions	KFS	Compliant – Ongoing
National Forest Policy, 2023	Sustainable forest management, conservation and restoration	State Department for Forestry / KFS	Consistent – Ongoing
Wildlife Conservation and Management Act, 2013, as amended 2025	Protection of wildlife and habitats	KWS / KFS / relevant agencies	Conditional – Ongoing
Tourism Act, 2011, as amended	Sustainable tourism and tourism-sector licensing	TRA / Ministry responsible for Tourism	Conditional
Physical and Land Use Planning Act, 2019	Development permission and land-use compliance	County Government of Kajiado	Conditional
Land Act, 2012	Lawful land-use rights and protection of interests	NLC / KFS / County Government	Compliant subject to continued verification
Water Act, 2016	Lawful abstraction and	WRA	Conditional where

	protection of water resources		applicable
Water Resources Regulations, 2021	Water abstraction, conservation and monitoring	WRA	Conditional where applicable
Water Quality Regulations, 2024, as amended	Prevention of water pollution and lawful effluent management	NEMA	High-priority Conditional
Sustainable Waste Management Act, 2022	Waste minimization, segregation, recovery and lawful disposal	NEMA / County Government	Conditional – Ongoing
Waste Management Regulations, 2024, as amended	Waste handling, storage, transport and disposal	NEMA / County Government	Conditional – Ongoing
Plastic Packaging Regulations, 2024	Control and management of plastic packaging	NEMA	Conditional – Ongoing
Air Quality Regulations, 2024, as amended	Control of dust and atmospheric emissions	NEMA	Conditional – Ongoing
Noise and Excessive Vibration Regulations, 2009	Control of noise and vibration	NEMA / County Government	Conditional – Ongoing
Occupational Safety and Health Act, 2007	Worker health, safety, risk assessment and welfare	DOSHS	Conditional – Ongoing
Occupational Safety and Health subsidiary rules	First aid, medical surveillance, safety committees and related requirements	DOSHS	Conditional – Ongoing
Work Injury Benefits Act, 2007	Compensation for occupational injuries and diseases	DOSHS / Employer	Conditional – Ongoing
Public Health Act, Cap. 242	Sanitation, hygiene, nuisance and public health	County Public Health Department	Conditional – Ongoing
National Construction Authority framework	Contractor and construction-sector compliance	NCA	Conditional
National Building Code, 2024	Building design, construction, fire safety, accessibility and structural standards	County Government / NCA / relevant professionals	Conditional
Climate Change Act, 2016, as amended	Climate mitigation and adaptation	National Government / NEMA	Conditional – Ongoing
NCCAP 2023–2027	Low-carbon and climate-resilient development	National Government	Consistent – Ongoing
National Museums and Heritage Act, 2006	Protection of archaeological and cultural heritage	NMK	Compliant subject to chance-find procedure
County Government of Kajiado framework	Planning, public health, local infrastructure, waste and development control	County Government of Kajiado	Conditional
National environmental conventions	Biodiversity, climate and ecosystem conservation	National Government / NEMA / relevant agencies	Applicable through national law
Sustainable Development Goals	Sustainable tourism, conservation, employment and resource efficiency	Government / Proponent	Consistent with project objectives

CHAPTER THREE

3 DETAILED PROJECT DESCRIPTION AND DESIGN

3.1 Introduction

The proposed project involves the development, operation and management of a low-impact ecotourism facility at Murunya Camp Site within Oloolua Forest, Kajiado County. The project is being undertaken by Empakase Conservation Community Based Organisation (EMPAKASE CBO) under a Special Use Licence issued by the Kenya Forest Service (KFS). Unlike a conventional tourism or real-estate development, the proposed project has been conceived as a **forest-sensitive ecotourism destination**, where the existing Oloolua Forest constitutes the principal natural attraction. The development therefore seeks to provide recreation, environmental education, hospitality and community-based economic opportunities while retaining the ecological integrity and visual character of the forest.

The project will occupy approximately **7.63 acres (approximately 3.09 hectares)** within Oloolua Forest Station. The proposed development will comprise a dinosaur-themed recreational and educational attraction, elevated forest trails and boardwalks, an eco-restaurant, raised eco-lodges/cottages, picnic facilities, eco-toilets, parking, administration and ticketing facilities, visitor interpretation facilities, service areas and a modern indigenous tree nursery with a proposed production capacity of approximately **500,000 seedlings.**

The project design deliberately adopts a **low-impact construction philosophy**. Buildings and visitor infrastructure will, as far as technically practicable, be located within existing clearings and disturbed/open areas, while elevated structures will be supported using micro-piles or screw-pile systems designed to minimise excavation and disturbance of tree roots and soil. Elevated boardwalks will be routed around existing trees and sensitive ecological features rather than clearing vegetation to create conventional roads and paths. The project has adopted a **zero-tree-cutting target** as a fundamental design principle.



Figure 1: Proposed Master Layout Plan

3.2 Project Proponent

The project proponent is Empakase Conservation Community Based Organization, a community-based organization involved in conservation and community development activities associated with Oloolua Forest.

Table 3: Details of the Project Proponent

Item	**Details**
Project Proponent	Empakase Conservation Community Based Organisation
Registration No.	DSD/34/183/02/71892
Postal Address	P.O. Box 92-00511, Ongata Rongai
Chairperson / Key Contact	Peter Melonyie
Telephone	0722 659 586
Email	empakaseconservation2025@gmail.com
Project Site	Murunya Camp Site, Oloolua Forest
Licence Area	Approximately 7.63 acres / 3.09 ha

3.3 Project Location

The proposed development will be located at Murunya Camp Site within Oloolua Forest Station, approximately 4.5 kilometres from Ngong Township in Kajiado County. The site lies within the Nairobi Conservation Area and is administered within the Oloolua Forest Station under the Kenya Forest Service. The project area is located within a gazetted forest. The project Terms of Reference records that Oloolua Forest was gazetted under Proclamation No. 102 of 1941 and subsequently declared a Central Forest under Legal Notice No. 174 of 20 May 1964. The licensed project area is approximately 7.63 acres (3.09 hectares). The boundary coordinates supplied in the project documentation are referenced to UTM Zone 37 South as follows:



Figure 2: Satellite Image of the proposed Site

3.4 Site Context and Environmental Setting

The proposed development is fundamentally different from a conventional greenfield tourism development because it is located within an existing forest ecosystem. Oloolua Forest forms part of the remaining indigenous forest landscapes within the Nairobi metropolitan region and provides ecological, recreational, educational and community values. Available literature describes Oloolua as a forest ecosystem containing indigenous vegetation and wildlife habitats, while more recent conservation initiatives emphasise the importance of community involvement in protecting and restoring the forest. The forest also supports recreational activities including nature walks, picnicking and nature appreciation. Existing public information on Oloolua identifies established trails, waterfalls and the historically significant Mau Mau cave among the attractions associated with the forest.

The environmental sensitivity of the site is therefore a fundamental determinant of the project design. The project has been conceived to **fit within the existing forest rather than replace the forest**.

3.5 Objectives of the Proposed Project

The proposed project has four principal and interrelated objectives.

(a) First, it seeks to establish a high-quality, ecotourism destination providing recreational and educational experiences within a living forest environment.

(b) Second, the project seeks to demonstrate the application of low-impact development principles within a gazette forest, particularly through elevated structures, reversible construction techniques, use of existing clearings and a strict zero-tree-cutting approach.

(c) Third, the project seeks to contribute directly to forest conservation through establishment and operation of a modern indigenous tree nursery with a proposed capacity of approximately 500,000 seedlings and rehabilitation of not less than 15.26 acres of Oloolua Forest in accordance with the project license obligations.

(d) Fourth, the development seeks to establish a sustainable model of community-benefiting forest tourism that integrates conservation, education, recreation and responsible economic activity over the license period and beyond.

3.6 Main Components of the Proposed Development

3.6.1 Dinosaur Theme Park

The principal visitor attraction will be a dinosaur-themed recreational and educational facility integrated into the forest setting. The dinosaur attraction will comprise appropriately designed dinosaur exhibits positioned at selected locations along the visitor trail. The exhibits are intended to provide an educational experience linking prehistoric life and evolution with contemporary environmental conservation.

The exhibits will be positioned within designated clearings or carefully selected locations so that their installation does not require unnecessary removal of vegetation or major disturbance of the forest floor. The dinosaur attraction will be supported by interpretation and educational material intended to encourage visitors, particularly children and families, to understand biodiversity, forests, environmental conservation and natural history.

3.6.2 Elevated Nature Trails and Boardwalks

A major component of the development will be an elevated forest trail and boardwalk system. The trail system will provide controlled pedestrian access through the forest and will form an important component of the dino-park experience. Rather than creating conventional earth roads through the forest, the design will

utilize elevated boardwalks that can weave around existing trees and sensitive areas. The elevated approach is intended to:

- ✓ minimize soil excavation
- ✓ reduce disturbance to tree root systems;
- ✓ minimize compaction of the forest floor;
- ✓ reduce alteration of natural drainage;
- ✓ concentrate visitor movement onto defined routes;
- ✓ improve visitor safety; and
- ✓ make sections of the facility potentially demountable and reversible.



Figure 3:Example of a nature boardwalk

3.6.3 Eco-Lodges / Raised Cottages

The proposed hospitality component will comprise five raised eco-lodges/cottages designed to provide overnight accommodation within the forest environment. The accommodation structures will adopt a lightweight and forest-sensitive design approach. The structures will be elevated to minimize their physical footprint and reduce unnecessary disturbance of the ground surface. The lodges will be positioned to maintain appropriate separation from mature trees and sensitive ecological features. Privacy buffers and landscaping will be incorporated without compromising the existing forest canopy. The accommodation component will be operated as part of the wider ecotourism facility and will be supported by appropriate sanitation, water, waste-management, fire-safety and emergency-response systems.



Figure 4: Examples of Eco-Lodges

3.6.4 Eco-Restaurant

An eco-restaurant will form part of the public activity zone. The restaurant will provide food and beverage services to visitors, staff and overnight guests. The facility will include appropriate kitchen, food preparation, storage, dining, sanitation and waste-management facilities. Because food preparation can generate wastewater, organic waste, packaging waste, grease and other wastes, the restaurant will incorporate appropriate grease management, wastewater management, solid-waste segregation and hygiene measures. The restaurant building will be designed using materials and finishes compatible with the forest environment and will avoid excessive reflective surfaces, unnecessary lighting and visually intrusive structures.

3.6.5 Museum and Educational Facilities

The development will incorporate visitor interpretation and educational facilities associated with the dinosaur attraction and forest conservation. The interpretation component will provide information on prehistoric life, biodiversity, indigenous trees, forest ecology, conservation, climate change and the cultural significance of the forest. The educational function is important because the project is intended not simply to provide recreation but also to encourage environmental awareness and responsible visitor behaviour. Interpretation signage will be strategically located along the visitor circulation system without excessive signage proliferation or visual intrusion.

3.6.6 Picnic and Recreational Facilities

The Special Use License provides for a **picnic site and recreational ground**. Picnic facilities will be located primarily within suitable existing open areas to minimize vegetation clearance. Facilities may include seating, shelters, waste receptacles, visitor information points and associated sanitation facilities. Visitor use will be controlled to prevent littering, trampling of vegetation, uncontrolled fires and disturbance of wildlife.

3.6.7 Eco-Toilets and Sanitation Facilities

The project will incorporate **eco-toilets and other appropriate sanitation facilities** designed for the environmental sensitivity of the forest setting. The sanitation system will be selected and designed based on the site's soil conditions, groundwater characteristics, anticipated visitor numbers, staff population and applicable public-health and environmental requirements. Wastewater and sewage management will be designed to prevent contamination of soil, groundwater and nearby surface-water features. No untreated

sewage or wastewater shall be discharged into the forest environment.

3.6.8 Parking and Arrival Facilities

The project will include a controlled **arrival and parking area**. The arrival zone will provide a controlled entrance, gatehouse, visitor orientation and parking. Parking will be designed using **permeable or semi-permeable surfaces where technically feasible**, thereby reducing stormwater runoff and maintaining some infiltration. The parking area will be appropriately sized to the anticipated visitor capacity and shall avoid unnecessary expansion into forested areas. Vehicle speeds within the site will be controlled to minimize collision risks involving visitors and wildlife.

3.6.9 Administration and Ticketing Facilities

An administration and ticketing facility will be established near the arrival zone. The facility will provide space for visitor registration, ticketing, security, administration and operational management. The location will enable controlled visitor access while preventing uncontrolled movement of visitors into sensitive forest areas. The Special Use License specifically provides for office space serving the dino-park ticketing function.

3.6.10 Indigenous Tree Nursery

One of the most significant conservation components of the project will be establishment of a modern indigenous tree nursery. The proposed nursery will have a capacity of approximately 500,000 indigenous tree seedlings. The nursery will support:

1. rehabilitation of degraded portions of Oloolua Forest;
2. replacement and enrichment planting where authorized;
3. wider forest restoration initiatives;
4. environmental education;
5. community participation in conservation; and
6. availability of indigenous planting material for appropriate restoration programmes.

Nursery operations will include seed collection where authorized, propagation, potting, watering, hardening, disease management, seedling maintenance and distribution. Only ecologically appropriate species will be propagated, with emphasis on indigenous species suitable for the local forest ecosystem. The nursery therefore represents an important positive environmental component of the project rather than merely an ancillary commercial facility.

3.6.11 Forest Rehabilitation Programme

The project will support rehabilitation of **not less than 15.26 acres of Oloolua Forest** as required under the project license arrangements. Rehabilitation will be undertaken in consultation with the Kenya Forest Service and in accordance with an approved forest management and restoration approach. The rehabilitation programme will include site identification, ecological assessment, selection of appropriate indigenous species, planting, maintenance, replacement of failed seedlings and monitoring of survival rates. The rehabilitation programme will be treated as a **core project commitment** and will be incorporated into the project's Environmental and Social Management and Monitoring Plan.

3.6.12 Energy Supply and Energy Efficiency

The development will require energy for lighting, restaurant equipment, refrigeration, water pumping, visitor facilities, accommodation, administration, security systems and other operational functions. The project will prioritize energy efficiency through efficient lighting, appropriately sized equipment, controlled operating hours and energy-conscious building design. Solar power will be prioritized where feasible, particularly for lighting, security systems, hot-water applications and other suitable loads.

3.6.13 Wastewater and Effluent Management

Wastewater will arise from eco-lodges, restaurant operations, sanitary facilities, staff facilities and other visitor activities. The project will provide an appropriate wastewater-management system designed to prevent pollution of soil, groundwater, surface water and the surrounding forest ecosystem. Wastewater-treatment infrastructure will be appropriately maintained, and treated effluent will only be discharged, reused or otherwise managed in accordance with applicable regulatory requirements. Particular attention will be given to the restaurant kitchen, where grease and food residues can compromise wastewater systems. Appropriate grease traps and kitchen-waste management systems will therefore be incorporated.

3.6.14 Solid Waste Management

Solid waste will arise during both construction and operation. During construction, waste streams will include packaging, timber off-cuts, surplus construction materials, metal, plastics, cement bags and excavated material. During operation, waste will primarily comprise food waste, paper, plastics, glass, packaging, general domestic waste, sanitary waste and maintenance-related waste. A waste hierarchy will be adopted, prioritizing:

avoidance → reduction → reuse → recycling/recovery → appropriate disposal.

Waste segregation will be undertaken at source, with appropriate containers provided for different waste streams. Food waste from the restaurant will be separately managed to minimize odor, pests and unnecessary disposal. Hazardous wastes such as used oils, chemical containers, batteries and contaminated materials will be separately stored and handled through appropriately authorized waste-management systems.

3.7 Project Design Philosophy

The overarching design philosophy is **"minimum footprint, maximum conservation value."** The project will not seek to transform the forest into a conventional built environment. Instead, the built components will be inserted into the existing ecological landscape in a manner that maintains the dominant forest character. The design principles will include:

i. **Retention of existing trees.** The project adopts a zero-tree-cutting target. Any unavoidable tree-related issue shall be referred to KFS and addressed through the applicable approval process.

ii. **Use of existing clearings.** Buildings and high-intensity visitor facilities will preferentially occupy existing clearings and previously disturbed areas.

iii. **Elevated construction.** Boardwalks and selected structures will be elevated to minimize ground disturbance.

iv. **Root-zone protection.** Construction activities, material storage and vehicle movement will be controlled to prevent damage and compaction within tree root zones.

v. **Reversible construction.** Lightweight and demountable systems will be preferred where technically feasible, allowing eventual removal with limited residual disturbance.

vi. **Low-impact materials.** Timber, local stone and other materials compatible with the forest setting will be considered, while highly reflective or visually intrusive finishes will be avoided.

vii. **Water efficiency.** Water-efficient fixtures, rainwater harvesting and appropriate wastewater management will be incorporated.

viii. **Renewable energy.** Solar energy will be prioritized where technically and economically feasible, particularly for lighting and selected auxiliary services.

ix. **Low-impact lighting.** Lighting will be designed to minimize unnecessary illumination of the forest and reduce disturbance to nocturnal wildlife.

x. **Controlled visitor movement.** Visitors will be directed along designated trails and access routes to prevent uncontrolled trampling and disturbance.

3.8 Construction Phase

3.8.1 Construction Materials and Equipment

Likely materials will include timber, steel, concrete and cement products, roofing materials, local stone, aggregates, fasteners, glass, plumbing materials, electrical cables, sanitary fixtures, paints and finishes. The project will prioritize durable, locally available and environmentally appropriate materials while avoiding materials whose extraction, use or disposal creates unacceptable environmental impacts. Materials shall be sourced from lawful and appropriately licensed suppliers. Because of the forest setting, material quantities delivered to site shall be carefully planned to prevent unnecessary stockpiling and reduce the risk of soil compaction and vegetation damage.

The project is expected to require relatively specialized and limited construction equipment compared with a conventional large-scale building project. Heavy earthmoving equipment will be restricted to areas where its use is demonstrably necessary and approved.

3.8.2 Labour Requirements

The project will generate employment during construction and operation. Construction employment will include engineers, architects, environmental specialists, foremen, skilled artisans, carpenters, electricians, plumbers, welders, equipment operators, general labourers and security personnel. Operational employment will include management personnel, guides, hospitality staff, restaurant workers, cleaners, gardeners, nursery staff, ticketing personnel, security personnel, maintenance workers and other support staff.

A major social objective of the project is to ensure meaningful participation of surrounding communities. The Investor Agreement provides for **60% of employment opportunities to be allocated to local community members**. This commitment shall be incorporated into the project's social management and monitoring framework, with recruitment records maintained to demonstrate compliance.

3.9 Operational Phase

Upon completion, the facility will operate as an integrated ecotourism destination. Daily operations will include controlled visitor admission, dinosaur-park activities, nature-trail experiences, interpretation and environmental education, restaurant services, overnight accommodation, picnicking and tree nursery operations.

3.9.1 Visitor Management

Because uncontrolled visitor movement can cause trampling, littering, wildlife disturbance and fire risk, visitors will be managed through designated access points and controlled trails. Visitor numbers will be managed according to the carrying capacity and operational requirements established through the final design and environmental management programme. Visitors will be provided with information on forest etiquette, waste disposal, fire prevention, wildlife safety and prohibited activities. The elevated trail will provide a defined circulation system and reduce uncontrolled movement through sensitive forest areas.

3.9.2 Fire Prevention and Emergency Preparedness

Fire represents one of the most significant operational risks because of the project's location within a forest. The facility will therefore incorporate fire-prevention and emergency-response measures covering:

- fire detection;
- fire extinguishers;
- emergency water supply;
- emergency access;
- evacuation routes;
- assembly points;
- staff fire training;
- regular drills;
- visitor evacuation procedures;
- vegetation management around critical infrastructure; and
- coordination with KFS and relevant emergency services

3.9.3 Lighting and Noise Management

Artificial lighting will be designed to provide adequate visitor and staff safety while minimizing unnecessary illumination of the forest. Where technically practicable, low-intensity, directional and controlled lighting will be used. Lighting will be particularly controlled around wildlife-sensitive areas. Noise-generating activities will be managed through operating-hour controls, equipment maintenance and appropriate visitor management.

3.10 Decommissioning and Site Restoration

The proposed development is linked to the duration and conditions of the Special Use License. Should the license not be renewed, or should individual project components reach the end of their useful life, decommissioning will be undertaken in accordance with a detailed **Decommissioning and Rehabilitation Plan** approved by the relevant authorities. Decommissioning will prioritize removal of demountable and lightweight structures and recovery of reusable materials. The process will include:

1. controlled closure of visitor facilities;
2. removal of equipment and movable assets;
3. dismantling of boardwalks and demountable structures where required;
4. removal of waste;
5. segregation and recycling of suitable materials;
6. safe disposal of non-recyclable waste;
7. removal or remediation of temporary foundations where required;
8. restoration of disturbed ground;
9. re-establishment of appropriate indigenous vegetation; and
10. monitoring of the restored areas.

3.11 Project Inputs and Resource Requirements

The principal project inputs will include construction materials, labour, water, energy, transport, specialized equipment and hospitality supplies. Unlike a conventional building project, the principal resource requirement during operation will not simply be physical infrastructure. The project will require continued management of the forest ecosystem, visitor flows, water, energy, waste and conservation activities**.**

Table 4: Project Inputs

Input	***Application***	***Environmental Management Requirement***
Timber	Boardwalks, raised structures and finishes	Lawful sourcing and sustainable procurement
Steel	Structural and support elements	Efficient use and recycling of off-cuts
Concrete/cement	Foundations and selected structures	Controlled mixing and prevention of washout
Local stone	Building finishes	Lawful sourcing
Water	Construction, sanitation, restaurant, nursery	Conservation and rainwater harvesting
Solar energy	Lighting and selected services	Prioritised where technically feasible
Electricity	Operations and accommodation	Energy efficiency
Fuel	Construction equipment/backup power	Spill and fire controls
Labour	Construction and operation	Local recruitment and OHS
Food and hospitality supplies	Restaurant/lodges	Sustainable procurement and waste reduction
Nursery inputs	Tree propagation	Indigenous species and responsible nursery management

3.12 Project Outputs

The project will generate both physical and environmental/social outputs. Physical outputs will include the completed ecotourism structures, boardwalks, visitor facilities, accommodation units, restaurant, nursery, parking and associated infrastructure. Operational outputs will include visitor services, accommodation, educational programmes, conservation activities, indigenous seedlings, community employment and local enterprise opportunities.

Environmental outputs will include forest rehabilitation, conservation education, improved visitor management and increased awareness of forest protection. The project is therefore expected to generate a combination of economic, social, educational and environmental benefits**,** provided that the environmental controls and license conditions are fully implemented.

CHAPTER FOUR

4 BASELINE ENVIRONMENTAL AND SOCIO-ECONOMIC INFORMATION

4.1 Introduction

This chapter presents the baseline environmental, ecological, socio-economic and cultural conditions of the proposed **Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County**. The purpose of establishing the baseline is to provide a clear description of the existing environmental and social conditions against which potential changes arising from the proposed project can be identified, predicted and evaluated. The baseline also provides the foundation for determining the environmental sensitivity of the project area, assessing the significance of potential impacts and developing appropriate mitigation, monitoring and enhancement measures. The assessment has been undertaken in accordance with the approved Terms of Reference (TOR), the project Special Use Licence, the Concept Masterplan, available secondary information, preliminary site reconnaissance and stakeholder information.

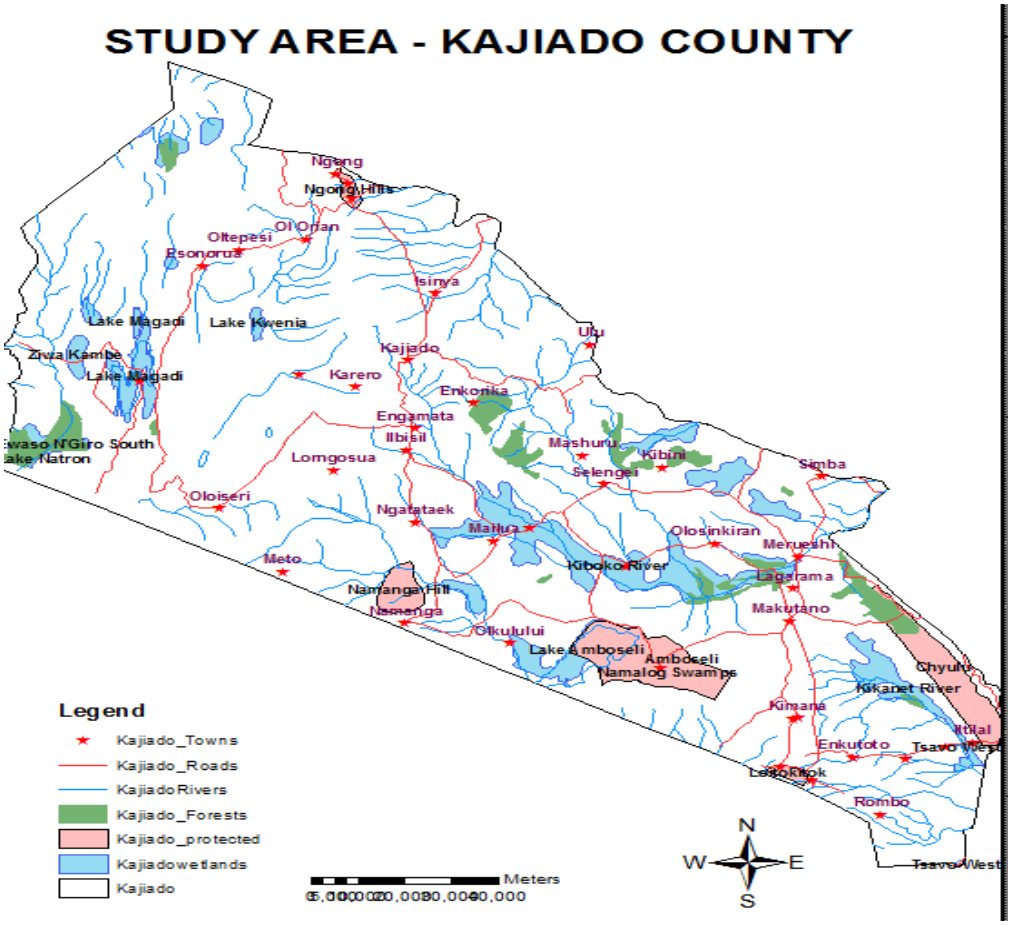


Figure 5:Kajiado County

The baseline assessment is particularly important because the proposed development is located within **Oloolua Forest**, a gazetted public forest managed under the Kenya Forest Service (KFS). Oloolua is listed among Kenya's gazetted public forests under the Forest Conservation and Management Act. The proposed project is therefore being assessed within an environmentally sensitive forest setting rather than on an ordinary undeveloped commercial site. The existing forest ecosystem is both the principal environmental receptor and the central attraction upon which the proposed ecotourism concept is based. The project has accordingly been conceived as a forest-led destination rather than a forest-replacement development, with the Concept Masterplan proposing that buildings be concentrated within existing clearings, forested areas be retained for the dinosaur and nature-trail experience, and raised structures and boardwalks be used to reduce disturbance to soils and tree-root systems.

4.2 Project Location

The proposed development is located at Murunya Camp Site within Oloolua Forest Station, Kajiado County**,** within the Nairobi Conservation Area under the Kenya Forest Service. The project site is approximately 4.5 km from Ngong Township**.** The licensed development area covers approximately **7**.63 acres (3.09 hectares)**.** The project is located within a forest environment in close proximity to rapidly urbanizing settlements and the wider Nairobi metropolitan area. The Proponent is Empakase Conservation Community Based Organisation, registered under Registration No**.** DSD/34/183/02/71892, with its postal address at P.O. Box 92-00511, Ongata Rongai. The project is authorized under Special Use Licence No. LIC003/2026**,** issued by Kenya Forest Service on 30 March 2026, for development and operation of an ecotourism facility within the licensed area.

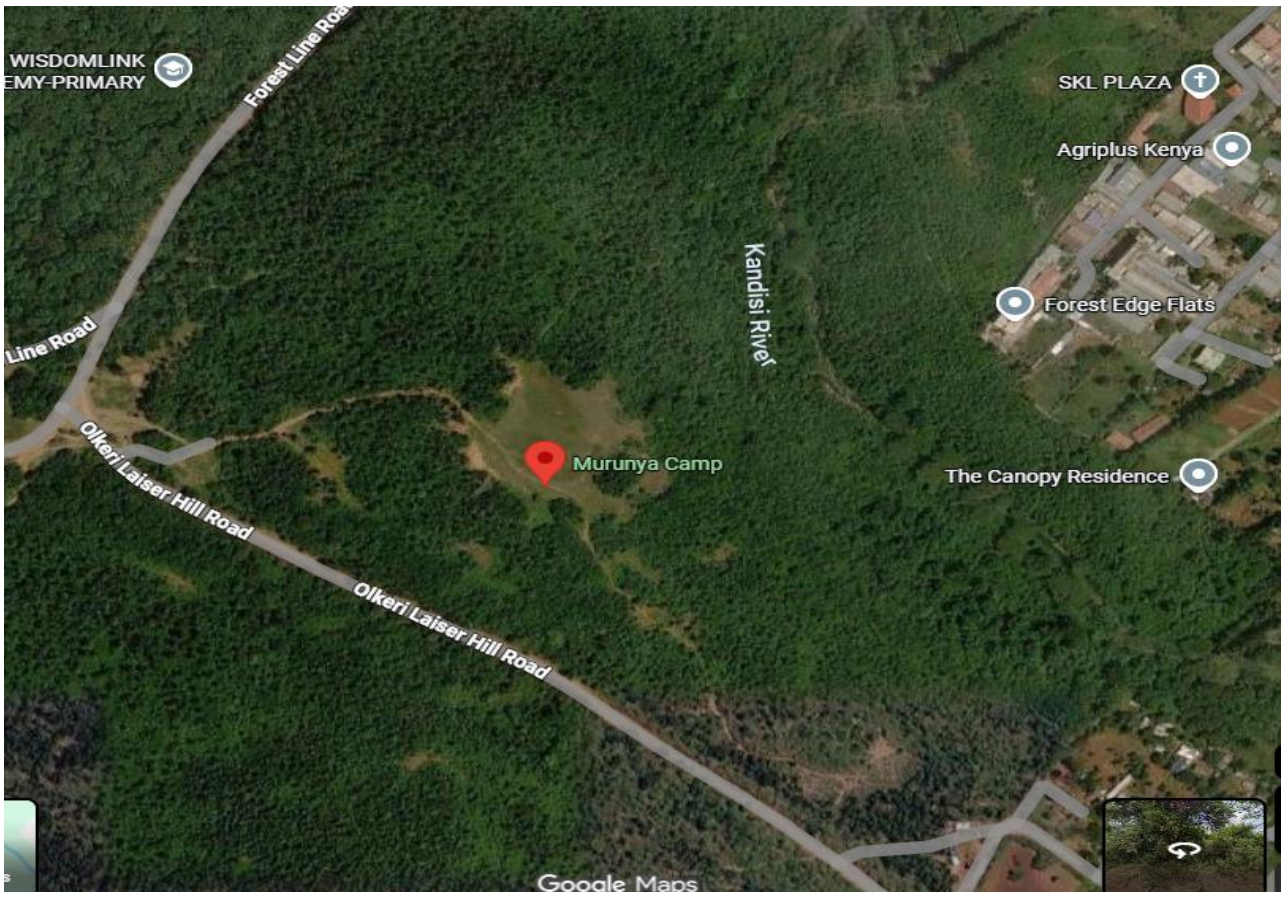


Figure 6: Satellite Image of the proposed project site

4.3 Land Tenure, Forest Status and Existing Land Use

The proposed development area is located within **Oloolua Forest Station**, which forms part of Kenya's public forest estate. Oloolua Forest is included in the Third Schedule of the Forest Conservation and Management Act as a gazetted public forest, with Gazette reference Legal Notice No. 102 of 1941. The forest is administered through the Kenya Forest Service framework. KFS manages public forests through forest conservation areas, county forest conservation areas and forest stations. The Nairobi Conservation Area includes forest resources within the wider Nairobi/Kajiado landscape.

The proposed project therefore does not represent a change from a private agricultural or residential land use to tourism. Rather, it represents a licensed compatible-use activity within a gazetted forest**,** subject to the conditions of the Special Use Licence and applicable environmental and forestry requirements. The existing landscape surrounding the proposed site comprises forest cover, existing forest tracks and clearings, recreational and conservation uses, neighbouring settlements and urbanising areas. The Concept Masterplan

identifies the existing forest cover as the principal design asset and constraint. It proposes using existing access tracks rather than opening new wide roads, locating high-activity visitor functions close to existing clearings and retaining forested sections as the setting for raised trails and robotic dinosaur exhibits.

4.4 Physical Environment

4.4.1 Topography and Terrain

The project area forms part of the Ngong/Oloolua landscape of Kajiado County, characterized by elevated terrain and dissected landscapes associated with the Nairobi–Ngong highland zone. The precise site topography shall be established through the detailed topographical survey required under the project implementation programme.

The Concept Masterplan currently identifies existing clearings, forested areas and access tracks as key determinants of the development layout. The final position of buildings and elevated structures will therefore need to respond to actual ground levels, drainage pathways, existing vegetation and tree-root protection requirements. Topography is particularly important to the project because excessive earthworks could result in soil disturbance, erosion, altered runoff and unnecessary damage to vegetation. The preferred development approach is consequently to **adapt the structures to the existing terrain rather than substantially re-grade the site**.

4.4.2 Geology and Geomorphology

The wider Kajiado region is geologically diverse, reflecting volcanic, sedimentary and basement-rock formations associated with the Rift Valley and surrounding highlands. The Ngong area forms part of the elevated volcanic landscape west and southwest of Nairobi. The underlying geological conditions may influence foundation design, groundwater occurrence, drainage and susceptibility to erosion. Because the proposed structures include raised cottages, boardwalks, visitor facilities and potentially lightweight buildings, detailed foundation investigations will be required before construction. The final engineering design should therefore be informed by:

- topographical survey;
- geotechnical investigation;
- soil-bearing capacity assessment;
- groundwater conditions where relevant; and
- drainage and erosion assessment.

4.4.3 Soils and Soil Characteristics

The soils within the wider Kajiado/Ngong landscape vary according to geology, topography, drainage and vegetation. At the project level, the most environmentally important soil characteristics are not simply agricultural productivity but soil stability, infiltration capacity, erosion susceptibility, compaction and the relationship between soils and existing tree-root systems. The forest floor contains organic matter derived from leaf litter and decomposing vegetation. This surface layer performs important ecological functions, including nutrient cycling, moisture retention and habitat provision.

Construction activities that strip, compact or contaminate the forest floor could therefore reduce ecological function even where the area of physical disturbance is relatively small. The project design responds to this sensitivity by proposing elevated structures and boardwalks supported on low-impact foundations rather than extensive conventional earthworks. The Concept Masterplan specifically proposes micro-piles or screw piles for elevated elements to reduce excavation and protect root systems. A detailed soil assessment should

be undertaken during the pre-construction phase to establish areas requiring erosion protection, drainage control or restricted construction activity.

4.4.4 Climate and Meteorological Conditions

Kajiado County experiences considerable spatial and temporal variation in climate because of differences in altitude, topography and proximity to the Nairobi metropolitan highlands. The county generally experiences a bimodal rainfall regime, with the principal rainfall periods occurring during the March–May long rains and October–December short rains. The Ngong highland area generally receives more rainfall than the drier eastern and southern parts of Kajiado County.

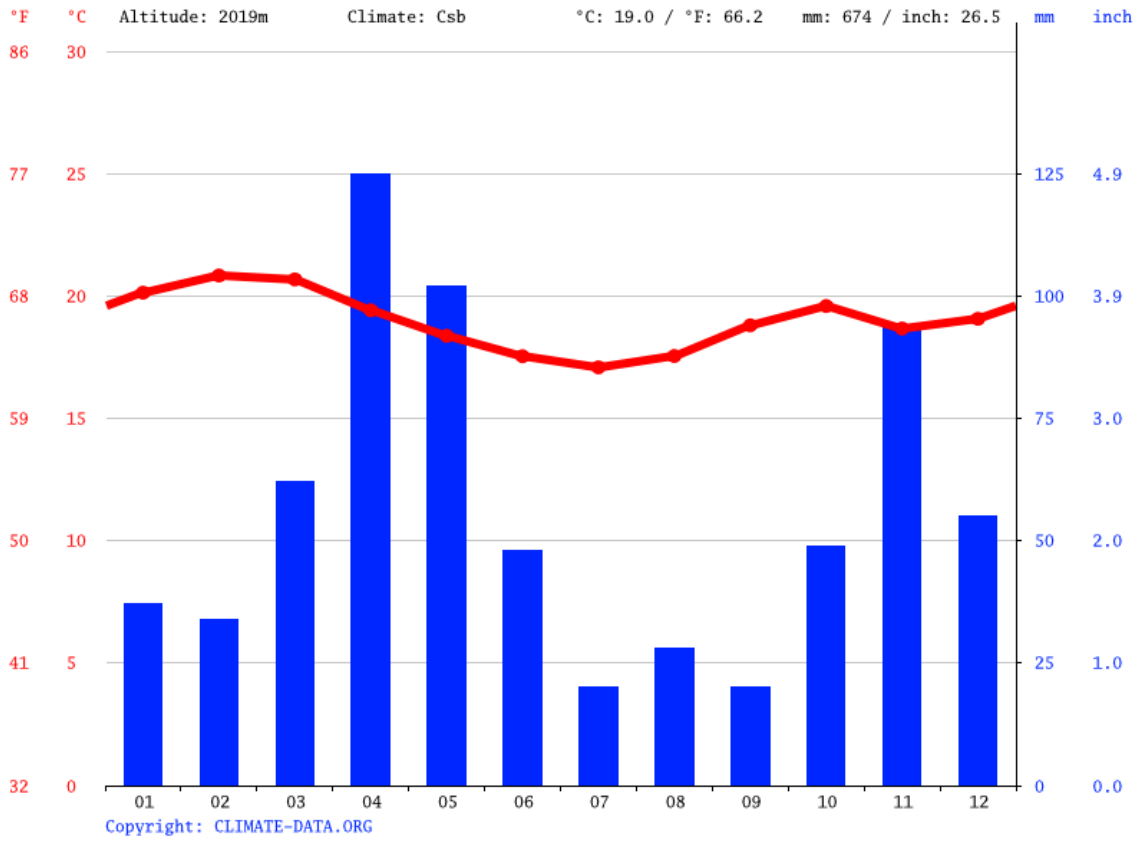


Figure 7: Ngong Climate Graph by Month

County-level climate information indicates that rainfall varies considerably across Kajiado, with the Ngong, Ongata Rongai and Kiserian zone receiving relatively higher rainfall than much of the wider county. The climate of the project area is therefore more favorable for forest vegetation than the semi-arid conditions experienced in many other parts of Kajiado County. Climate variability is nevertheless an important consideration for the proposed project. Recent county climate-risk assessments identify drought, rainfall variability and flash flooding as relevant climate hazards in Kajiado County. For the proposed project, climate considerations include:

- intense rainfall and stormwater runoff;
- localized flooding and erosion;
- prolonged dry periods;
- increased wildfire risk during dry conditions;
- heat stress;
- water availability;
- impacts of extreme weather on raised structures and boardwalks; and

- changing ecological conditions within the forest.

4.4.5 Air Quality

The existing air environment at Murunya Camp Site is expected to be predominantly influenced by natural forest conditions, local vehicle movements, nearby urban activity and occasional dust generated along unpaved access tracks. The forest vegetation provides an important natural filtration function by intercepting particulate matter and supporting local microclimatic regulation. No significant industrial emission source has been identified within the project footprint.

However, construction activities could temporarily increase particulate matter through vehicle movement, excavation, material handling and construction traffic. Operational activities are expected to generate substantially lower air-quality impacts, although traffic, kitchen emissions, generators and maintenance activities may contribute localized emissions. Baseline air-quality monitoring should be undertaken where required to establish representative pre-construction conditions, particularly for particulate matter and other parameters identified through the environmental risk assessment.

4.4.6 Ambient Noise and Vibration

The existing acoustic environment is expected to be predominantly characterized by natural forest sounds, birds and other wildlife, wind through vegetation and intermittent human activity associated with forest visitors, nearby roads and settlements. The forest setting means that baseline noise levels are likely to be lower than those experienced in densely developed urban areas.

Noise sensitivity is therefore an important environmental consideration. The proposed project introduces several potential sources of noise, particularly during operation of robotic dinosaur exhibits, visitor activities, kitchen and hospitality operations, service vehicles and maintenance equipment. Therefore, there is the need for quiet hours, sound-level controls, emergency stop points, CCTV and guided management of high-energy dinosaur effects.

Baseline noise measurements should therefore be undertaken at representative receptor locations and used to establish operational noise controls. Particular attention should be given to the potential effect of artificial sound and sudden noise on forest fauna.

4.4.7 Hydrology and Drainage

Hydrology is a critical baseline component because forest ecosystems depend strongly on natural infiltration, groundwater recharge, surface runoff and drainage processes. The Oloolua ecosystem is associated with the Mbagathi River system, which forms an important hydrological feature within the wider forest landscape. Research on Oloolua identifies the Mbagathi River as an important geographic feature of the forest area. The forest landscape also contains springs and other water-related ecological features. Recent public-sector information describes the Oloolua–Ngong ecosystem as supporting springs and river systems that contribute to surrounding ecological and community functions. The project footprint itself shall be surveyed to establish:

- natural drainage pathways;
- low-lying areas;
- runoff direction;
- existing erosion features;
- areas of high infiltration;
- potential seasonal water accumulation;
- proximity to watercourses; and
- any sensitive drainage or wetland features.

The project should maintain natural drainage patterns as far as practicable and avoid concentrating stormwater discharge into erosion-prone areas. Impermeable surfaces should be minimized, with permeable paving and controlled runoff preferred where technically appropriate.

4.4.8 Landscape Character and Visual Amenity

The landscape character of the site is dominated by the existing forest environment. The forest canopy, natural vegetation, trails, clearings and associated ecological features constitute the principal visual resource and are themselves part of the proposed tourism product. The project therefore differs from conventional tourism developments where buildings are the dominant attraction.

4.5 Biological Environment

4.5.1 Overview of Oloolua Forest Ecosystem

Oloolua Forest is an ecologically important forest within the Nairobi metropolitan landscape. Published research describes Oloolua as a tropical dry forest located partly within the Ngong area of Kajiado and extending toward Nairobi. The forest has historically comprised both indigenous forest and plantation areas and supports a variety of habitats. More recent biodiversity research continues to demonstrate significant mammalian diversity within Oloolua Forest. A rapid survey reported 25 mammal species in Oloolua, including rodents, shrews, artiodactyls, carnivores, lagomorphs and primates.

The ecological importance of the forest is reinforced by current government restoration initiatives. In May 2026, the National Irrigation Authority participated in a tree-planting exercise in Oloolua Forest as part of wider forest restoration and climate-resilience efforts. The activity described Oloolua as part of the Ngong Forest Block and highlighted the area's ecological and restoration importance. These characteristics reinforce the need for the project to be implemented using a precautionary, low-disturbance approach.

4.5.2 Vegetation and Flora

The vegetation of Oloolua Forest is characterized principally by indigenous forest vegetation, together with areas influenced by historic plantation activity and human disturbance. The forest floor comprises leaf litter, shrubs, grasses, regeneration and other understory vegetation, while mature trees form the principal canopy structure. The existing trees perform several ecological functions, including:

- carbon sequestration;
- soil stabilization;
- microclimate regulation;
- habitat provision;
- water infiltration and regulation;
- nutrient cycling;
- landscape and recreational value; and
- support for wildlife.



Figure 8: Vegetation at Oloolua Forest

Because the proposed project is located within the forest, individual trees are treated as critical environmental receptors rather than simply vegetation to be cleared where necessary. The project therefore adopts a **zero-tree-cutting target**.

4.5.3 Fauna and Wildlife

Oloolua Forest provides habitat for a range of wildlife species, including small and medium-sized mammals, primates, birds, reptiles, amphibians and invertebrates. Published research has documented considerable mammalian diversity within Oloolua, while broader ecological studies indicate that the forest supports a range of fauna associated with the forest habitat. The forest's biodiversity value means that even relatively small disturbances can have ecological consequences where they affect feeding areas, nesting sites, movement routes, breeding areas or nocturnal behavior.



Figure 9: Fauna and Flora at Oloolua Forest

4.5.4 Ecological Connectivity

The wider Oloolua–Ngong forest landscape forms part of a fragmented green infrastructure system within an increasingly urbanized metropolitan environment. Maintaining ecological connectivity is therefore important. The project should avoid introducing unnecessary barriers to wildlife movement and should minimize fencing, excessive lighting and other features that could disrupt movement. The proposed use of forest trails and elevated boardwalks is preferable to opening new wide roads or extensive ground-level pathways.

4.6 Socio-Economic Environment

4.6.1 Regional Socio-Economic Context

The project lies within the rapidly urbanizing Kajiado–Nairobi metropolitan interface. Ngong and Ongata Rongai are important urban centers in the project influence area, with strong linkages to Nairobi through residential, commercial, transport and employment systems. The proximity of the project to Ngong Township provides a significant opportunity for local employment and tourism-related enterprise development. At the same time, urbanization places increasing pressure on forest ecosystems through settlement expansion, infrastructure development, recreation and other human activities. The project therefore needs to demonstrate that tourism development can coexist with forest conservation.

4.6.2 Population and Settlement

The immediate project area is characterized by a combination of established and expanding settlements, particularly around Ngong, Ongata Rongai and adjacent peri-urban areas. Ongata Rongai: Recorded a population of roughly 172,590 in the 2019 census, with current estimates projecting growth toward over 244,000 residents. Recorded a core township and location population of around 25,866 during the 2019 census, while broader estimates for the immediate urban area place it near 101,000.

4.6.3 Livelihoods and Economic Activities

The local economy includes formal and informal employment, retail and service businesses, transport, tourism-related activities and other urban and peri-urban livelihoods. The proposed project has potential to support local livelihoods through direct employment, procurement, transport services, tourism supply chains, guiding, hospitality and small-business opportunities.

Employment is expected to be one of the principal positive socio-economic benefits. The stakeholder consultation tool proposes a target of **at least 60% local labor**, subject to availability of appropriately qualified personnel. The project should prioritize local recruitment where skills are available and should support training and skills development for positions where local capacity is initially limited. Employment opportunities are expected during both construction and operation.

4.6.4 Forest Use and Community–Forest Relationships

Oloolua Forest has recreational, conservation, educational and livelihood-related importance to surrounding communities. The forest is already used for nature-based recreation, walking, cycling, education and tourism. Community and conservation organizations also have interests in forest stewardship. The proposed project should therefore avoid unnecessary exclusion of legitimate forest users and should clearly communicate changes to access, visitor routes, safety restrictions and areas temporarily closed during construction.

4.6.5 Tourism and Recreation

Oloolua Forest already possesses substantial recreational value. The forest is recognized as a destination for nature trails, picnics, forest recreation and nature-based tourism. KFS also identifies **Oloolua Forest Park**

among its ecotourism investment opportunities, confirming the suitability of compatible tourism activities within the forest-management framework. The proposed Empakase project therefore builds upon an existing recreational function rather than introducing tourism into an entirely unused landscape. The key environmental question is consequently whether increased tourism intensity can be accommodated without reducing the ecological quality that makes the forest attractive.

4.6.6 Cultural Heritage and Archaeological Context

The wider Oloolua landscape has historical and cultural associations, including traditional use of forest resources and heritage features associated with the broader Ngong/Oloolua environment. The baseline assessment shall establish through stakeholder consultation whether any specific cultural, spiritual, historical or archaeological sites occur within or adjacent to the project footprint. No cultural or archaeological feature shall be assumed to be absent merely because it has not been identified during preliminary reconnaissance.

4.6.7 Existing Environmental Management and Conservation Initiatives

The Oloolua Forest landscape is subject to ongoing conservation and restoration activities. Kenya Forest Service is responsible for management of public forests nationally, while community and conservation organizations also participate in forest stewardship. Recent government restoration activity in Oloolua further demonstrates the environmental importance of the forest. In May 2026, a tree-planting initiative was undertaken in Oloolua Forest as part of wider restoration and climate-resilience efforts. This existing conservation context is important to the ESIA because the proposed project should complement rather than conflict with ongoing forest restoration activities. The proposed indigenous tree nursery and forest rehabilitation commitments provide opportunities for the project to contribute positively to these broader conservation objectives.

4.7 Climate Change and Disaster Risk Baseline

Climate change is incorporated into the baseline because the current environmental assessment regulations require consideration of climate-change vulnerability, adaptation and mitigation within environmental assessment reports. The project is potentially exposed to:

- ✓ **Drought and water stress:** Reduced rainfall or prolonged dry periods could affect water availability, vegetation condition and fire risk.
- ✓ **Extreme rainfall:** intense rainfall could cause erosion, localized flooding and damage to trails, boardwalks and drainage infrastructure.
- ✓ **Wildfire:** Higher temperatures and prolonged dry periods may increase forest-fire risk.
- ✓ **Heat stress:** Workers and visitors may experience increased heat exposure during extreme conditions.
- ✓ **Ecological change:** Climate variability may influence vegetation composition, wildlife behavior and forest regeneration.

The project therefore requires climate-resilient drainage, fire management, water efficiency, emergency preparedness and ecological monitoring.

CHAPTER FIVE

5 PUBLIC PARTICIPATION AND STAKEHOLDER ENGAGEMENT

5.1 Introduction

Public participation is a fundamental component of the Environmental and Social Impact Assessment (ESIA) process for the proposed **Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County**. The process provides an opportunity for potentially affected persons, neighbouring communities, forest users, government agencies, conservation stakeholders, community representatives and other interested parties to understand the proposed development, raise concerns, provide recommendations and contribute to the identification and management of potential environmental and social impacts. The public participation process for the proposed project was undertaken with the objective of ensuring that local knowledge, community concerns, expectations and recommendations were incorporated into the ESIA process and, where practicable, reflected in the project design, mitigation measures, environmental management plan and monitoring programme.

The public participation process is consistent with Regulation 17 of the Environmental (Impact Assessment and Audit) Regulations, 2003, which requires proponents, in consultation with NEMA, to seek the views of persons who may be affected by a project and provides for public meetings, written and oral comments and appropriate notification of affected communities.

5.2 Objectives of Public Participation

The principal objectives of the public participation and stakeholder engagement process were to:

1. Inform potentially affected communities and stakeholders about the proposed low-impact ecotourism facility at Murunya Camp Site.

2. Explain the nature, scope, components and anticipated benefits of the proposed development.

3. Provide stakeholders with an opportunity to raise environmental, social, economic, cultural and safety concerns.

4. Obtain local knowledge regarding the existing condition and use of Oloolua Forest and the Murunya Camp Site.

5. Identify potential impacts that may not be apparent from technical investigations alone.

6. Obtain recommendations for avoiding, minimizing and managing adverse environmental and social impacts.

7. Identify opportunities through which the project can contribute to local employment, enterprise development, conservation and community development.

8. Understand community expectations concerning access to the forest, tourism activities, employment and participation in project benefits.

9. Provide stakeholders with an opportunity to comment on the proposed conservation-sensitive design and proposed mitigation measures.

10. Incorporate relevant stakeholder concerns into the ESIA impact assessment, Environmental and Social Management and Monitoring Plan (ESMMP) and project implementation arrangements.

11. Establish a mechanism for continued stakeholder engagement and grievance resolution throughout

the project cycle.

5.3 Stakeholder Identification and Mapping

The stakeholders considered relevant to the proposed project include persons and institutions with an interest in, influence over, or potential to be affected by the project. The principal stakeholder categories considered during the consultation process included:

5.3.1 Direct Stakeholders and Project Beneficiaries

- ❖ Empakase Conservation Community Based Organisation (Proponent);
- ❖ Project staff, contractors and local service providers;
- ❖ Local community members expected to benefit from employment, enterprise and community-benefit arrangements (target of at least 60% local labour).

5.3.2 Indirect Stakeholders within the Zone of Influence

- ❖ Nearby residents of Oloolua, Gataka, Gatugota, Mukaa, Murunyaga, Ngong, Ongata Rongai and adjacent settlements;
- ❖ Community Forest Association (CFA) members and Community-Based Organisations (CBOs) active in forest stewardship;
- ❖ Forest users – livestock keepers, beekeepers, herbalists/traditional medicine users, firewood collectors, religious/cultural/traditional users;
- ❖ Ecotourism workers, local traders, teachers/students/researchers, women's groups and youth groups;
- ❖ Local businesses and tourism-related enterprises in the Ngong–Ongata Rongai corridor.

5.3.3 Regulatory Authorities, Lead Agencies and Relevant Institutions

Kenya Forest Service (KFS), National Environment Management Authority (NEMA), Kajiado County Government, Kenya Wildlife Service (KWS), Water Resources Authority (WRA), and other institutions with statutory or technical interests in forest conservation, tourism and environmental management.

5.4 Public Participation Methodology

A multi-method engagement approach was adopted to maximize reach, inclusivity and quality of information. The methods employed included structured questionnaires, two formal Public Consultation Meetings, Key Informant Interviews, Focus Group Discussions, institutional consultations and continuous community liaison.

5.4.1 Structured Household / Community Questionnaires

A standardized ESIA questionnaire was administered to members of the public within the project's zone of influence. The questionnaire covered demographic information, respondent relationship to the forest, frequency of forest use, perception of current forest condition, expected project benefits, concerns/worries, support for proposed mitigation measures, and overall support for the project. Questionnaires were administered in person, with assistance provided where necessary to ensure comprehension and accurate completion. Responses were treated confidentially.

A total of approximately one hundred (100) completed questionnaires were collected across the three survey

batches conducted in the project area (primarily between July and August 2026). Respondents were drawn from nearby residents, CFA members, CBO members, forest users and other stakeholders living within and beyond 3 km of Oloolua Forest.

5.4.2 Public Consultation Meetings

Formal Public Consultation Meetings (PCMs) were convened as part of the ESIA process. The meetings provided an open forum for project disclosure, question-and-answer sessions, and the collection of verbal comments that complemented the questionnaire survey. Attendance registers, minutes and photographic records were maintained for each meeting.

5.5 Public Consultation Meetings

Three principal public consultation meetings were undertaken during the preparation of the ESIA.

Table 5: Summary of Public Consultation Meetings

Meeting	Date/Period	Principal Participants	Main Purpose
First Consultation Meeting	1ST July 2026	Empakase CBO, community members and ESIA experts	Introduction of the proposed project, explanation of the project concept and preliminary identification of community concerns, expectations and recommendations
Second Consultation Meeting	During the ESIA consultation period	Community Forest Association (CFA), relevant community/forest stakeholders and project representatives	Engagement on forest conservation, community participation, forest use, potential environmental impacts and management of the proposed ecotourism development
Third Consultation Meeting	13 August 2026	General community, Empakase CBO, project representatives and other stakeholders	Detailed community consultation, collection of views, concerns, recommendations and level of support for the proposed project

5.5.1 First Public Consultation Meeting – 1 July 2026

The first consultation meeting was undertaken on 1ST July 2026 at the Gatugota borehole area, Oloolua forest and brought together representatives of Empakase Conservation CBO, members of the community and the ESIA experts**.** The meeting provided an initial platform for introducing the proposed Low-Impact Ecotourism Facility and explaining the purpose of the ESIA process. Particular attention was given to the project's intention to establish a low-impact tourism destination within Murunya Camp Site while maintaining the ecological character and conservation value of Oloolua Forest.

The consultation introduced the principal project concepts, including the proposed visitor facilities, recreational activities, nature-based experiences, accommodation and associated infrastructure. The consultation also provided an opportunity to explain the proposed forest-sensitive design approach, including the retention of existing trees and minimization of ground disturbance. Participants were encouraged to identify existing environmental and social issues within and around the project area and to express their expectations and concerns regarding the proposed development. Minutes of the meeting are appended.



Figure 10: CBO and local Community Engagement

5.5.2 Second Consultation Meeting – Community Forest Association

The second stakeholder engagement was conducted through the **Community Forest Association (CFA)**. The CFA engagement was particularly important because the proposed development is located within Oloolua Forest and therefore requires careful consideration of forest conservation, community participation and sustainable forest use. Minutes and attendance appended.

5.5.3 Third Public Consultation Meeting – General Community

The third public consultation meeting was held on 13 August 2026 at Murunya Camp Site, Oloolua Forest, with the general community and other stakeholders. The formal invitation from the Assistant Chief,

Empakasi Sub-location, identified the meeting as a public participation meeting concerning the proposed Oloolua CFA project and related developments. The invitation specifically described the proposed development as including an ecotourism picnic site, nature trail and eco-lodge at Murunya Camp within Oloolua Forest. The stated objectives of the meeting included:

1. Informing the public about the proposed project;
2. Receiving views, comments, concerns and recommendations from stakeholders;
3. Fulfilling ESIA public consultation requirements; and
4. Ensuring that community views were considered during project planning and implementation.

The meeting therefore provided a formal platform for the broader community to comment on the project and its anticipated environmental, social and economic implications. Minutes are appended.



Figure 11: Community Members Showing No Objection to the project



Figure 13: Area Chief Addressing the Meeting



Figure 12: Various Government Representatives and Private Institutes Associated to Oloolua Forest

5.6 Analysis of Stakeholder Views

The consultation process demonstrated that stakeholders generally recognized the potential of the proposed ecotourism facility to generate socioeconomic and conservation benefits while also identifying environmental and social risks that require effective management.

The principal **potential benefits** identified through consultation included:

- Employment creation;
- Opportunities for local businesses and service providers;
- Improved tourism and recreational opportunities;
- Environmental education;
- Promotion of forest conservation;
- Support for tree nursery development and forest restoration;
- Skills development;
- Increased opportunities for local tourism-related enterprises;
- Community participation in tourism activities; and
- Potential contribution to community development through the Empakase CBO.

The principal **concerns and potential adverse impacts** identified included:

- Damage to trees and tree roots;
- Disturbance of wildlife;
- Increased visitor pressure on the forest;
- Noise;
- Excessive artificial lighting;
- Solid waste and litter;
- Wastewater and sanitation;
- Fire risk;
- Traffic and access;
- Visitor safety;
- Possible disruption of existing forest use;
- Equitable access to employment and business opportunities; and
- Protection of cultural and spiritual values.

5.6.1 Summary of Questionnaire Findings

The questionnaire survey of approximately 100 respondents provides quantitative support for the qualitative findings of the Public Consultation Meetings. The principal results are summarized below.

5.6.2 Demographic Profile of Respondents

Respondents comprised both men and women, with a predominance of male respondents. Age distribution spanned 18–25, 26–35, 36–50 and 51+, with the largest groups in the 36–50 and 51+ brackets. Respondents resided in Oloolua, Gataka, Gatugota, Mukaa, Murunyaga and neighbouring areas. Proximity to the forest ranged from less than 500 m to more than 3 km, with a substantial proportion living within 1 km of the forest boundary.

Demographic Variable	Summary of Responses
Gender	Predominantly male; female and "prefer not to say" also represented
Age	Majority 36–50 and 51+; younger age groups also present
Place of residence	Oloolua, Gataka, Gatugota, Mukaa, Murunyaga and adjacent settlements
Proximity to forest	Mix of <500 m, 500 m–1 km, 1–3 km and >3 km; significant number live close to the forest

5.6.3 Respondent Relationship to Oloolua Forest

Respondents identified with multiple overlapping roles. The most frequently cited categories were: Nearby resident; Community Forest Association (CFA) member; Community-Based Organization (CBO) member; Person collecting firewood or other forest products; Religious, cultural or traditional user; Ecotourism worker / forest protection or patrol group member; and Livestock keeper, beekeeper, herbalist, local trader, teacher/student/researcher, and women's/youth group member. This diversity confirms that the sample captured both everyday forest users and organized community institutions with a direct stake in forest governance and conservation.

5.6.4 Frequency of Forest Use and Perception of Forest Condition

Respondents reported a range of use frequencies from daily to rarely; a notable proportion of nearby residents and CFA/CBO members reported regular (weekly or more frequent) use. Perceptions of current forest condition were generally positive for trees and forest cover and mixed for wildlife, water sources, cleanliness, safety and path condition—***highlighting both the ecological value of the forest and areas requiring management attention.***

5.6.5 Expected Project Benefits

The most frequently selected benefits were jobs for local people, business opportunities for local suppliers, opportunities for guides/tourism services, improved forest protection, tree nursery and forest restoration, better visitor facilities, education/recreation for schools and families, and support to community projects. Very few respondents selected "No expected benefit."

Expected Benefit	Relative Frequency
Jobs for local people	Very high
Business opportunities for local suppliers	Very high

Opportunities for guides / tourism services	High
Improved forest protection	High
Tree nursery and forest restoration	High
Better facilities / visitor services; education & recreation; community projects	Moderate–High

5.6.6 Concerns and Worries Raised

The most commonly cited worries (consistent with issues raised at both Public Consultation Meetings) were tree cutting or damage to roots, wildlife disturbance, fire risk, more litter or wastewater, and noise/too much light. Lower-frequency concerns included loss of access, damage to cultural sites, traffic and conflict with forest users.

Concern / Worry	Relative Frequency
Tree cutting or damage to roots	High
Wildlife disturbance	High
Fire risk	Moderate–High
More litter or wastewater; Noise / too much light	Moderate
Loss of access; cultural sites; traffic; conflict; cost of living	Low–Moderate

5.6.7 Support for Proposed Measures and Overall Project Support

Overwhelming majorities indicated “Support” for every proposed measure (avoid cutting trees and use raised boardwalks; solar power and rainwater harvesting; large indigenous tree nursery; limit visitor entry at busy/sensitive times; low lighting at night; restore degraded parts of the forest). When asked whether they support the proposed facility, the great majority selected “Yes, I support it.” A small number selected “Yes, but with conditions” (most commonly linked to job creation and continued tree/wildlife protection). Very few selected “Not sure.”

This high level of support, reinforced by the open-floor contributions at both Public Consultation Meetings, indicates that the local community views the project as compatible with forest conservation provided the stated safeguards are fully implemented.

5.7 Disclosure and Grievance Redress

This ESIA Study Report, including the present chapter, will be disclosed in accordance with NEMA requirements. A Grievance Redress Mechanism (GRM) will be established and maintained throughout the project lifecycle to receive, record and respond to community concerns in a timely, transparent and culturally appropriate manner. The GRM will be accessible to all stakeholders, including those who may not have participated in the questionnaire survey or the two Public Consultation Meetings. Contact details for the Proponent and the ESIA Consultant will be made available at the project site, through community leadership structures, and at the Gatugota and Murunya information points to facilitate ongoing communication.

5.8 Conclusion

The public participation and stakeholder engagement process undertaken for the proposed Low-Impact Ecotourism Facility at Murunya Camp Site has been comprehensive, inclusive and consistent with the requirements of the Constitution of Kenya, EMCA, the EIA/EA Regulations and the conditions of Special Use license No. LIC003/2026. Two formal Public Consultation Meetings were held—These meetings, together with the questionnaire survey of approximately 100 respondents, Key Informant Interviews and community liaison, generated a clear and consistent set of community expectations and concerns.

Respondents and meeting participants expect tangible benefits in the form of local jobs, business opportunities, improved forest protection, an indigenous tree nursery and forest restoration. At the same time, they have clearly articulated concerns about tree cutting, root damage, wildlife disturbance, fire risk, water-source protection, waste management and continued legitimate access to forest resources.

These concerns are directly addressed by the project's defining design commitments—zero tree cutting, raised boardwalks and structures, root-zone protection, low-impact lighting, controlled visitor management, solar power and rainwater harvesting, indigenous tree nursery, rehabilitation of degraded forest areas, and a robust fire and waste-management regime. The near-universal support expressed for these measures, and the absence of formal objection at either Public Consultation Meeting, confirm that the community regards the proposed safeguards as both necessary and adequate.

The findings of this engagement process have been fully incorporated into the impact assessment, mitigation hierarchy and Environmental and Social Management and Monitoring Plan presented in subsequent chapters of this ESIA Study Report. Continued stakeholder engagement and a functional Grievance Redress Mechanism will remain essential throughout construction, operation and any eventual decommissioning. On the basis of the evidence gathered from the questionnaires and the two Public Consultation Meetings, the ESIA concludes that the proposed project enjoys a high level of social acceptability among the consulted stakeholders, provided that the environmental and social commitments set out in this report and in the Special Use license are fully implemented and monitored.

CHAPTER SIX

6 ANALYSIS OF PROJECT ALTERNATIVES

6.1 Introduction

The consideration and analysis of project alternatives is an important component of the Environmental and Social Impact Assessment (ESIA) process. The purpose of alternatives analysis is to identify the most technically feasible, environmentally sustainable, socially acceptable and economically viable means of achieving the objectives of a proposed development while avoiding or minimizing adverse environmental and social impacts.

For the proposed **Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County**, alternatives analysis is particularly important because the project is proposed within a **gazetted forest ecosystem**. The existing forest vegetation, tree root systems, wildlife habitat, landscape character and ecological functions constitute both the principal environmental constraints and the principal attraction upon which the proposed ecotourism experience is based.

The project is therefore fundamentally different from a conventional tourism or commercial development. The project's design philosophy is to establish a forest-led destination rather than replace the forest with buildings. The proposed facility is intended to combine conservation, education, recreation, hospitality and community benefits while maintaining the ecological integrity of Oloolua Forest. The approved Terms of Reference establish a strict zero-tree-cutting target, use of elevated and reversible structures, protection of root zones, forest rehabilitation and establishment of an indigenous tree nursery as central principles of the project. The alternatives considered in this ESIA therefore focus not only on whether the project should proceed, but also on *where and how different components should be located, how they should be constructed, how resources should be supplied and managed, how the development should be phased, and how the project can achieve its objectives with the lowest practicable environmental footprint.* The following alternatives have been considered:

- the No-Project/No-Action Alternative;
- alternative site/location considerations;
- alternative site layouts and spatial configurations;
- alternative architectural and structural designs;
- alternative construction technologies and materials;
- alternative energy sources;
- alternative water supply and conservation measures;
- alternative wastewater and sanitation systems;
- alternative solid-waste management systems;
- alternative access, circulation and visitor-management arrangements;
- alternative project phasing and implementation schedules; and
- the proposed development alternative incorporating environmental and social mitigation.

The preferred alternative is consequently not simply the option with the lowest construction cost. It is the option that provides the best balance between ***forest conservation, biodiversity protection, community benefits, visitor experience, technical feasibility, financial viability and compliance with the Special Use license and applicable environmental requirements***.

6.2 No-Project/No-Action Alternative

The No-Project Alternative assumes that the proposed Low-Impact Ecotourism Facility would not be implemented and that the licensed area would remain under its existing condition and management regime. From an environmental perspective, this alternative would result in the lowest immediate development-related disturbance because there would be no construction activities, foundations, boardwalk installation, visitor infrastructure, increased vehicle movement, construction waste or additional operational wastewater and solid waste associated with the proposed facility. The No-Project Alternative would also eliminate potential risks associated with construction and operation, including temporary soil disturbance, noise, dust, accidental damage to tree roots, wildlife disturbance, increased fire risk, visitor pressure and traffic.

However, the No-Project Alternative would also mean that the conservation, educational, recreational and socioeconomic opportunities associated with the proposed development would not be realized. The project has been conceived to use tourism as a mechanism for supporting forest conservation and community participation. The project objectives include establishment of an indigenous tree nursery with a proposed capacity of **500,000 seedlings**, rehabilitation of not less than **15.26 acres of Oloolua Forest**, local employment, local business opportunities, educational programmes and community benefit streams.

The No-Project Alternative is therefore environmentally conservative in the short term but does not achieve the conservation, educational, recreational and socioeconomic objectives for which the project has been proposed. **Conclusion:** *The No-Project Alternative is retained as the environmental and socioeconomic baseline against which the other alternatives are assessed, but it is* ***not the preferred alternative****, provided that the proposed development is implemented in accordance with the low-impact design, licence conditions and ESIA mitigation requirements.*

6.3 Alternative Site/Location

Alternative site analysis considers whether the same project objectives could be achieved at another location with fewer environmental and social impacts. For this project, alternative locations outside the proposed Murunya Camp Site could theoretically reduce some of the environmental sensitivity associated with development within a gazetted forest. A site outside the forest could, for example, reduce direct interaction between built infrastructure and existing forest vegetation and wildlife habitat.

However, relocation would fundamentally change the character and purpose of the proposed development. The project's concept is based on an immersive ecotourism experience within the living Oloolua Forest, where the forest itself constitutes the primary attraction. The concept masterplan expressly describes the development as a forest-led destination and proposes using existing clearings for buildings while retaining forested areas as the setting for elevated boardwalks and the dinosaur experience.

Furthermore, the proposed site is already the subject of a Kenya Forest Service Special Use Licence. The TOR identifies the licensed area as approximately 7.63 acres and places the development within Oloolua Forest Station. Consequently, relocation to an unrelated site would require a new land-use assessment, land access arrangements, new approvals and potentially new environmental and social impacts. It would also undermine the project's specific conservation-tourism concept.

6.4 Alternative Site Layouts and Spatial Configurations

Because the project is located within a forest, spatial planning is one of the most important environmental mitigation measures. Three broad layout approaches were considered.

6.4.1 Conventional Development Layout

Under this option, buildings and visitor facilities would be distributed across the site using conventional foundations, roads and pedestrian paths. This option would provide straightforward construction and

potentially lower initial construction complexity. However, it would require greater ground disturbance and could result in tree removal, root-zone disturbance, soil compaction and fragmentation of the existing forest environment. It would therefore be inconsistent with the project's zero-tree-cutting objective.

6.4.2 Concentrated Development in Existing Clearings

Under this option, relatively intensive visitor facilities would be concentrated in existing open or previously disturbed areas, while the forested portions would remain largely undeveloped. This arrangement substantially reduces the physical footprint within sensitive forest areas. The concept masterplan specifically proposes locating administration, museum, restaurant, parking and other higher-activity facilities primarily within existing open ground.

6.4.3 Forest-Sensitive Zoned Layout

The preferred layout combines concentrated development in existing clearings with elevated, low-impact infrastructure through forested sections. The layout is divided into:

1. Arrival Zone – controlled entry, gatehouse, parking and orientation;
2. Public Activity Zone – administration, museum/interpretation center, restaurant, children's play area and washrooms;
3. Dino Forest Zone – elevated boardwalk loop with robotic dinosaur encounter areas and interpretation;
4. Hospitality Zone – five raised tented cottages; and
5. Services Zone – staff facilities, power systems, waste segregation, storage and deliveries.

This layout reduces unnecessary crossing of sensitive forest areas, separates public and service circulation and retains the forest as the principal landscape feature. **Preferred Alternative:** *Alternative 3 is preferred because it provides the best balance between visitor functionality and ecological protection.*

6.5 Alternative Architectural and Structural Designs

The architectural alternatives were assessed according to their potential effects on trees, soil, hydrology, landscape character, energy use, construction footprint and reversibility.

6.5.1 Conventional Ground-Based Buildings

A conventional construction approach using extensive excavation and strip or reinforced-concrete foundations would provide familiar construction methods and potentially lower technical complexity. However, within forested areas this approach would increase:

- excavation;
- soil disturbance;
- root damage;
- vegetation clearance;
- soil compaction;
- stormwater runoff;
- construction waste; and
- permanent alteration of the forest floor.

The approach is therefore not compatible with the project's zero-tree-cutting philosophy.

6.5.2 Lightweight Elevated Structures

The preferred alternative is to use lightweight, elevated and, where practicable, demountable structures. The concept design proposes raised tented cottages approximately one meter above ground and elevated boardwalks that weave around existing tree trunks. Foundations are proposed to use micro-piles, screw piles or other appropriately designed point-support systems positioned outside major root zones, subject to detailed structural and ecological assessment. The principal advantages are:

- reduced excavation;
- reduced root disturbance;
- reduced soil compaction;
- reduced interference with surface drainage;
- improved reversibility;
- reduced visual mass; and
- retention of the natural forest floor.

The project design therefore adopts the principle of **"build lightly within a living forest.**

6.6 Alternative Construction Materials and Technologies

The project has been conceived as a lightweight forest-lodge development using timber, local stone, canvas/tensile roofing and non-reflective earth-toned finishes.

Table 6: Construction Technology Alternatives

Option	**Environmental Performance**	**Construction Complexity**	**Suitability**
Conventional masonry/concrete	Moderate to low	High excavation	Not preferred in forest zones
Heavy permanent structures	Low	High	Not preferred
Lightweight timber/canvas structures	High	Moderate	Preferred
Elevated demountable structures	Very high	Moderate	Most preferred for forest zones
Raised boardwalks	High	Moderate	Preferred for forest circulation

Local materials may be used where environmentally and technically appropriate, provided they meet applicable quality and safety standards. The preferred approach is therefore a combination of lightweight, elevated, durable and reversible construction technologies, with permanent/heavier components concentrated in suitable existing clearings.

6.7 Alternative Energy Supply

Energy requirements will arise from administration, lighting, hospitality facilities, restaurant operations, visitor facilities, security systems, refrigeration and the robotic dinosaur exhibits. Three principal energy options were considered.

6.7.1 Conventional Grid-Dominated Supply

This option would rely primarily on electricity supplied through the conventional grid. Its advantage is reliability where grid infrastructure is available. However, it would not maximize the opportunity for renewable energy generation at the site and could require additional infrastructure.

6.7.2 Stand-Alone Solar Energy System

A solar photovoltaic system with battery storage could provide a significant proportion of the facility's energy demand. The concept design already provides for solar PV, inverter systems and battery backup.

6.7.3 Hybrid Renewable/Backup System

The preferred approach is a **solar-led hybrid energy system**, with efficient electrical equipment and appropriate backup capacity for critical loads. Energy conservation measures will include:

- LED lighting;
- occupancy and motion sensors;
- low-energy appliances;
- natural ventilation;
- daylight utilization;
- solar-powered external lighting where feasible; and
- low-energy visitor exhibits.

For forest protection, external lighting will incorporate dark-sky principles, including shielded fixtures, low-intensity lighting and motion controls. Preferred alternative: Solar-led energy system supplemented by appropriate backup/grid supply where required.

6.8 Alternative Water Supply and Conservation Measures

The project will require water for domestic use, sanitation, kitchen operations, cleaning, landscaping and staff facilities. Given the ecological sensitivity of Oloolua Forest, the preferred approach is to minimize abstraction and consumption through an integrated water-efficiency strategy. The following alternatives were considered:

Table 7: Summary of Alternative Water Supply

Alternative	**Assessment**
Conventional potable water supply only	Simple but increases dependence on external supply
Groundwater abstraction	Requires resource assessment and appropriate approvals; not automatically preferred
Rainwater harvesting	Low-impact and reduces demand on other sources
Water-efficient fixtures	Reduces operational consumption
Greywater reuse where approved	Reduces freshwater demand
Integrated water-efficiency system	Preferred

Rainwater harvesting will therefore form an important component of the water-management strategy, supplemented by an approved reliable source as determined during detailed design. Water-saving fixtures and appropriate monitoring will be installed to minimize consumption.

6.9 Alternative Wastewater and Sanitation Management Systems

Wastewater is a particularly important consideration because untreated discharge could adversely affect soil, surface water, groundwater and forest ecosystems. The alternatives considered include conventional septic systems, biodigesters, packaged wastewater treatment systems and other appropriately approved decentralized sanitation technologies.

6.9.1 Conventional Septic Tank and Soakaway

A septic system is relatively simple but requires appropriate soil conditions, adequate separation distances and regular desludging. In a sensitive forest environment, uncontrolled soakaway discharge presents potential risks to soil and groundwater if the system is poorly designed or overloaded.

6.9.2 Biodigester

A biodigester can provide onsite treatment and may generate biogas while reducing sludge volumes. Its suitability would depend on detailed design, loading, maintenance capacity and regulatory approval.

6.9.3 Decentralized Wastewater Treatment

A properly designed treatment system can provide a higher level of treatment and allow treated wastewater to be managed in accordance with applicable standards.

6.9.4 Integrated Low-Impact Sanitation System

The preferred approach is an appropriately designed decentralized wastewater/sanitation system, potentially incorporating eco-toilets, biodigester or packaged treatment technology depending on detailed engineering investigations and regulatory requirements. The selected system shall:

- prevent untreated wastewater discharge;
- protect groundwater and surface water;
- accommodate peak visitor and accommodation loads;
- provide safe sludge management;
- allow routine monitoring; and
- comply with applicable NEMA and water-quality requirements.

The final technology should therefore be confirmed during detailed design rather than assuming that one treatment technology is automatically suitable for the site.

6.10 Alternative Solid Waste Management Systems

The proposed facility will generate waste from visitor activities, restaurant operations, accommodation, administration, maintenance and construction. A conventional “collect and dispose” approach is not appropriate for an ecotourism facility located within a forest. The preferred alternative is an integrated waste-management hierarchy based on:

Avoid → Reduce → Reuse → Recycle → Recover → Dispose

Source segregation will be implemented using clearly labelled waste receptacles. Particular attention will be given to: food waste; recyclable packaging; glass; plastics; paper/cardboard; sanitary waste; maintenance waste; construction waste; and hazardous waste where generated. The service yard will incorporate a controlled waste-segregation area, consistent with the concept design. Waste that cannot be reused, recycled or otherwise recovered will be transported by appropriately authorized service providers to approved disposal facilities.

Preferred alternative: Integrated source-segregation, reduction, reuse, recycling and controlled disposal system.

Table 8: Comparative Analysis of Alternatives

Alternative	**Environmental Performance**	**Social Benefit**	**Technical Feasibility**	**Economic Viability**	**Overall Preference**
No Project	Very High	Low	High	Low/No project benefit	Baseline
Alternative Site Outside Forest	High	Moderate	Low–Moderate	Moderate	Not preferred
Conventional Ground-Based Design	Low–Moderate	Moderate	High	Moderate	Not preferred
Concentrated Clearing-Based Layout	High	High	High	High	Preferred component
Elevated Forest-Sensitive Layout	Very High	High	High	Moderate–High	Preferred
Conventional Energy Supply	Moderate	Moderate	High	Moderate	Secondary
Solar-led/Hybrid Energy	High	High	High	High over lifecycle	Preferred
Conventional Septic/Soak away	Moderate	Moderate	High	Moderate	Subject to site conditions
Decentralized treatment system	High	High	Moderate–High	Moderate	Preferred subject to design
Conventional waste disposal	Low	Low	High	Moderate	Not preferred
Integrated waste management	High	High	High	High	Preferred
Uncontrolled visitor movement	Low	Moderate	High	Moderate	Not preferred
Controlled/timed visitor movement	High	High	High	High	Preferred
Single-phase construction	Moderate	Moderate	High	Moderate	Not preferred
Phased implementation	High	High	High	High	Preferred

6.11 Conclusion

The alternatives assessment demonstrates that the environmental performance of the proposed development depends principally on how the project is designed and implemented rather than simply whether development occurs. The No-Project Alternative would avoid development-related environmental impacts but would also forego the proposed conservation, education, recreation, employment and community-benefit opportunities. A conventional tourism development involving extensive ground-based buildings, conventional foundations, uncontrolled visitor movement and intensive resource use would present substantially greater risks to the ecological integrity of Oloolua Forest and would be inconsistent with the project's stated purpose.

The preferred alternative is consequently the low-impact, forest-sensitive development option that concentrates built infrastructure in appropriate existing clearings, uses elevated and reversible structures within forested areas, protects existing trees and root systems, applies renewable-energy and water-conservation technologies, manages wastewater and solid waste responsibly, controls visitor movement and lighting, provides strong fire and emergency systems, and incorporates forest restoration and community benefits. The project should therefore proceed **only on the basis of the preferred low-impact alternative and subject to implementation of the mitigation measures, environmental monitoring requirements, KFS conditions, NEMA requirements and other statutory approvals applicable to the development**.

CHAPTER SEVEN

7 IMPACT IDENTIFICATION AND ASSESSMENT

7.1 Introduction

The assessment covers the entire project life cycle, namely:

1. pre-construction and planning;
2. construction;
3. operation and maintenance; and
4. decommissioning or abandonment.

The assessment considers both **positive and negative impacts**, including direct, indirect, short-term, long-term, reversible, potentially irreversible, localized and cumulative impacts. This approach is consistent with the project TOR, which requires systematic assessment across the full project lifecycle and consideration of impact direction, type, duration, reversibility and scale. Particular attention has been given to the environmental and social issues identified during project scoping, namely forest vegetation and root protection, soil and erosion, hydrology, wildlife, landscape character, water resources, solid waste, wastewater, stormwater, noise, lighting, air quality, fire risk, traffic and access, occupational health and safety, socio-economic benefits, community relations and cultural or spiritual values.

7.2 Impact Identification and Assessment Approach

Potential impacts have been identified by examining the relationship between proposed project activities and the environmental and social receptors that may be affected. The significance of each potential impact has been considered in terms of its likely magnitude, duration, spatial extent, sensitivity of the receiving environment, reversibility and the effectiveness of proposed mitigation or enhancement measures. The significance assessment adopts the following broad interpretation:

Table 9: Impact Assessment Approach

Significance	General interpretation
Major	Impact is potentially substantial, long-term or difficult to reverse and requires stringent management or avoidance.
Moderate	Impact may be noticeable and potentially significant but can be reduced to an acceptable level through effective mitigation.
Minor	Impact is localized, short-term or of relatively low magnitude and can readily be managed through routine controls.
Negligible	Impact is unlikely to result in a meaningful environmental or social change after standard controls.
Positive	Impact results in an environmental, social or economic benefit and should be enhanced where practicable.

7.3 Positive Impacts During Pre-Construction, Planning and Design

7.3.1 Employment and Professional Service Opportunities

The planning and design stage creates opportunities for architects, environmental experts, engineers, surveyors, ecologists, planners, quantity surveyors, project managers and other specialists involved in transforming the concept masterplan into detailed, environmentally responsive designs. The project TOR specifically provides for detailed topographical surveys, tree inventories, ecological sensitivity assessments, architectural and structural design and preparation of the ESIA and associated management plans. Although the employment generated at this stage will be temporary, it provides income to professionals and technical service providers and contributes to the local professional services economy.

Impact significance: Positive – Minor to Moderate.

Enhancement Measures: The Proponent and project consultants shall, where technically appropriate, engage qualified local professionals and service providers. Local procurement of professional and ancillary services shall be encouraged without compromising the competence requirements of specialist assignments.

7.3.2 Improved Environmental Planning and Forest Protection

One of the most important positive impacts of the planning stage is the opportunity to integrate environmental considerations into the project before physical development begins. The project has deliberately adopted a forest-led design approach in which the facility is intended to work around the existing forest rather than replace it. The concept requires a tree survey and root protection plan before finalization of building locations. It also proposes avoidance of conventional strip foundations in forested areas and the use of low-disturbance foundation systems where technically appropriate. This provides an opportunity to avoid or minimize impacts before construction rather than attempting to correct them after damage has occurred.

Impact significance: Positive – Major.

Enhancement Measures: The following shall be incorporated into detailed design:

- a comprehensive tree inventory and tree protection plan;
- identification and demarcation of root protection zones;
- confirmation of sensitive ecological areas before setting out;
- retention of existing mature trees wherever practicable;
- final positioning of structures only after ecological and structural verification;
- restriction of construction to approved footprints and designated access routes; and
- incorporation of the ESIA mitigation measures into contractor specifications and method statements.

7.3.3 Increased Stakeholder Awareness and Participation

The ESIA process provides an opportunity for local communities, forest users, government agencies, conservation groups and other stakeholders to understand the proposed development and participate in decisions concerning its implementation. The project stakeholder engagement framework specifically identifies local communities, Empakase CBO members, Community Forest Associations, conservation groups, tourism stakeholders, government agencies and surrounding residents as relevant stakeholders. The stakeholder questionnaire prepared for the project also focuses on employment, business opportunities, forest protection, tree nursery development, forest rehabilitation, waste management, wildlife, fire risk, traffic and community benefits.

Impact significance: Positive – Moderate.

Enhancement Measures: Community concerns and recommendations shall be incorporated into the detailed design, construction management arrangements and ESMMP. A documented grievance mechanism shall be maintained throughout construction and operation.

7.4 Positive Impacts During Construction

7.4.1 Creation of Local Employment

Construction of the proposed facility will create direct employment for skilled, semi-skilled and unskilled personnel. Potential employment categories include construction supervisors, artisans, carpenters,

electricians, plumbers, masons, equipment operators, laborers, security personnel, environmental and safety personnel and other support workers. The project has an explicit community benefit objective, with the TOR providing for **a minimum of 60% of positions to be reserved for community members** where suitably qualified persons are available.

Impact significance: Positive – Moderate to Major.

Enhancement Measures: Recruitment shall be transparent and non-discriminatory, with priority given to suitably qualified residents of surrounding communities. Employment records shall be maintained to demonstrate implementation of the local employment commitment.

7.4.2 Increased Local Procurement and Business Opportunities

Construction will create demand for locally available goods and services, including construction materials, food, transport, accommodation, equipment hire, fabrication, maintenance and other support services. Local enterprises may benefit from supplying the project provided that materials are legally sourced and meet the required technical and environmental standards.

Impact significance: Positive – Moderate.

Enhancement Measures: The contractor and Proponent shall, where practical, procure suitable materials and services from local suppliers. Local enterprises shall be provided with fair opportunities to participate in the project supply chain.

7.4.3 Skills Development and Technology Transfer

The project will provide opportunities for local workers to acquire or improve skills in environmentally sensitive construction techniques, including construction of lightweight structures, elevated boardwalks, low-disturbance foundations, solar systems, water conservation systems and environmental management.

Impact significance: Positive – Moderate.

Enhancement Measures: The contractor shall provide appropriate on-site training and toolbox talks. Where feasible, local workers shall be paired with skilled artisans and technicians to facilitate skills transfer.

7.4.4 Contribution to the County and National Economy

Construction expenditure will generate economic activity through procurement, labour payments, transport, professional services, statutory payments and associated business activity. The impact will extend beyond the immediate project site through the local supply chain.

Impact significance: Positive – Moderate.

7.5 Negative Impacts During Pre-Construction and Construction

7.5.1 Disturbance to Existing Forest Vegetation and Tree Root Systems

This is one of the most important environmental risks associated with the project. Although the project has adopted a zero-tree-cutting target, construction activities could inadvertently damage vegetation or tree roots through movement of workers and equipment, excavation, foundation installation, material storage, soil compaction, trenching or construction of access routes.

Mitigation Measures

The Proponent and contractor shall:

- undertake and approve a detailed tree inventory and root protection plan before construction;
- establish clearly marked root protection zones around retained trees;
- maintain the project's **zero-tree-cutting target**, except where any unforeseen safety-related intervention is formally assessed and authorized by the relevant authority;
- avoid conventional extensive excavation in forested areas;
- use micro-piles, screw piles or other low-disturbance foundation systems where confirmed suitable by structural and ecological specialists;
- prohibit storage of construction materials, cement, fuel or equipment beneath tree canopies or within root protection zones;
- prohibit unnecessary driving of heavy machinery through forested areas;
- use existing clearings and established access routes wherever practicable;
- undertake manual construction activities in environmentally sensitive locations;
- prevent soil compaction around retained trees; and
- immediately report and assess any accidental tree or root damage.

Potential significance: Major.
Residual significance: Minor, subject to strict implementation.

7.5.2 Soil Disturbance, Compaction and Erosion

Construction activities including movement of workers and equipment, installation of foundations, preparation of paths and construction of buildings may disturb soil and increase susceptibility to erosion. The risk is particularly relevant where vegetation is removed, natural drainage is obstructed or exposed soil is left unprotected during rainfall. The project's proposed elevated construction approach is expected to reduce the amount of ground disturbance compared with conventional development.

Mitigation Measures

Construction shall be undertaken in accordance with an approved erosion and sediment control method statement. Exposed soil shall be stabilized as soon as practicable. Drainage pathways shall be maintained, and stockpiles shall be located away from drainage lines and protected from erosion.

The contractor shall avoid unnecessary grading and shall reinstate temporarily disturbed areas after completion of works.

Permeable surfaces, bioswales, rain gardens or other appropriate nature-based drainage measures shall be incorporated where technically suitable.

Potential significance: Moderate.
Residual significance: Minor.

7.5.3 Construction Dust and Air Emissions

Dust may arise from limited earthworks, movement of vehicles, handling of sand and aggregates, construction activities and exposed soil. Exhaust emissions may also arise from construction vehicles and equipment. Because the project is located within a forest environment, unnecessary dust and emissions should be minimized to protect workers, visitors, vegetation and surrounding communities.

Mitigation Measures

The contractor shall control dust through appropriate water suppression, covering of dusty materials during transportation, speed control and avoidance of unnecessary idling of vehicles. Construction materials shall be handled carefully to prevent excessive dust generation. Vehicles and machinery shall be properly maintained, and visibly polluting equipment shall be removed from service until repaired.

Potential significance: Moderate.
Residual significance: Minor.

7.5.4 Noise and Vibration

Noise will arise from construction equipment, delivery vehicles, fabrication, carpentry, metal works and other construction activities. Unlike an ordinary construction site, noise within Oloolua Forest may also disturb wildlife and alter the experience of visitors and forest users.

Mitigation Measures

Construction activities shall be limited to approved working hours. No unnecessary horn use, shouting, amplified music or other avoidable noise shall be permitted.

Equipment shall be properly maintained and fitted with appropriate silencers. High-noise activities shall be scheduled and controlled. Where sensitive ecological receptors are identified, additional restrictions shall be imposed in consultation with the relevant specialists and Kenya Forest Service.

Potential significance: Moderate.
Residual significance: Minor.

7.5.5 Construction Waste Generation

Construction will generate packaging, timber offcuts, metal scraps, cement bags, plastics, surplus materials, excavated soil and other wastes. Poor waste management could result in littering, soil contamination, blockage of drainage channels, visual degradation and risks to wildlife.

Mitigation Measures

A site-specific Construction Waste Management Plan shall be implemented. Waste shall be segregated at source into reusable, recyclable, organic and residual waste streams.

Reusable materials shall be recovered wherever practical. Recyclable materials shall be transferred to appropriate recycling facilities, while residual and hazardous wastes shall be handled and transported by appropriately authorized waste handlers.

No waste shall be burned, buried or dumped within the forest. The construction site shall be inspected daily and cleared of loose waste that could be dispersed by wind or wildlife.

Potential significance: Moderate.
Residual significance: Minor.

7.5.6 Hazardous Materials and Accidental Oil or Fuel Spills

Construction machinery may require fuels, lubricants and other substances that could contaminate soil and water if improperly stored or handled. Because of the sensitivity of the forest ecosystem, even a relatively small spill could have consequences if it reaches soil, drainage channels or water resources.

Mitigation Measures

Fuel and hazardous substances shall be stored in secure, designated areas with appropriate secondary containment. Vehicle servicing shall, as far as practicable, be undertaken off-site or within an appropriately controlled service area.

Spill kits shall be available at relevant locations. Workers shall be trained in spill response, and contaminated soil shall be promptly isolated and handled appropriately.

Potential significance: Moderate.
Residual significance: Minor.

7.5.7 Construction Traffic, Access and Road Safety

Construction will generate additional movements of delivery vehicles, workers and service vehicles. Increased traffic may affect existing access routes and create risks to pedestrians, forest users and other road users.

Mitigation Measures

A Construction Traffic Management Plan shall be prepared before major construction begins. The plan shall address delivery schedules, vehicle speeds, pedestrian safety, loading and unloading, parking and emergency access.

Construction vehicles shall use designated routes and shall not create unnecessary tracks through forest areas. Drivers shall be inducted on low-speed driving and forest-site safety.

Potential significance: Moderate.
Residual significance: Minor.

7.5.8 Increased Water Demand During Construction

Construction workers and construction activities will require water for drinking, sanitation, cleaning and selected construction processes. Uncontrolled abstraction could place pressure on available water resources.

Mitigation Measures

Water use shall be monitored and controlled. Water-efficient construction practices shall be adopted. Potable water shall be provided for workers, while non-potable water may be used for appropriate construction purposes where permitted. No water source shall be abstracted without the necessary approvals.

Potential significance: Minor to Moderate.
Residual significance: Minor.

7.5.9 Occupational Health and Safety Risks

Construction involves risks associated with working at height, lifting, electrical works, welding, cutting, hand tools, machinery, elevated structures, slips and falls, falling objects and manual handling. The elevated nature of some proposed structures makes fall protection particularly important.

Mitigation Measures

The contractor shall implement a site-specific Occupational Health and Safety Plan incorporating task-specific risk assessments, safe systems of work, induction, toolbox talks, appropriate PPE, working-at-height controls, electrical safety, emergency response and first aid.

Only trained and authorized personnel shall undertake specialized activities. Work at height shall use appropriate access systems, guardrails, fall-arrest systems and rescue procedures.

A clearly identified first-aid point and emergency communication system shall be maintained.

Potential significance: Major.
Residual significance: Moderate to Minor with effective controls.

7.5.10 Community Health, Labour Influx and Social Risks

Construction workers recruited from outside the immediate area may increase interactions between incoming workers and surrounding communities. This may create temporary pressure on local services and increase risks associated with communicable diseases, social tension, harassment or other undesirable behavior.

Mitigation Measures

Local recruitment shall be prioritized in accordance with the project's community benefit commitments. Workers shall receive induction on acceptable conduct, public health, respect for communities and environmental protection. The contractor shall maintain appropriate welfare and sanitation facilities and implement a worker code of conduct. Mechanisms for reporting grievances and inappropriate behaviour shall be established.

Awareness on communicable diseases and appropriate health-seeking behaviour shall be incorporated into worker induction and ongoing toolbox talks.

7.5.11 Risk of Fire During Construction

The forest environment makes fire prevention a particularly important consideration. Welding, electrical works, cooking, smoking, fuel storage and other hot works may create ignition sources.

Mitigation Measures

Smoking shall be restricted to designated areas, while hot works shall require controlled procedures and appropriate fire precautions.

Fire extinguishers shall be strategically located, and workers shall be trained in their use. Combustible materials shall be stored safely and vegetation around controlled work areas shall not be unnecessarily accumulated as dry combustible material.

A site-specific emergency response procedure shall be developed in coordination with Kenya Forest Service and relevant emergency services.

Potential significance: Major.
Residual significance: Minor to Moderate.

7.6 Positive Impacts During Operation

7.6.1 Long-Term Employment Creation

The operational facility will create direct and indirect employment in hospitality, tourism, conservation, security, cleaning, maintenance, guiding, administration, food service, visitor management, nursery management and other functions.

Impact significance: Positive – Major. The Proponent shall maintain transparent recruitment records and periodically report the proportion of local employees.

7.6.2 Community Business Opportunities

Operation of the facility will create opportunities for local suppliers, guides, transport operators, artisans, curio traders and other enterprises. The project specifically provides for opportunities for local residents through curio shops and related tourism value-chain activities.

Impact significance: Positive – Major. The Proponent shall develop transparent procedures for allocation of local commercial opportunities and ensure that benefits are not concentrated among a small number of individuals.

7.6.3 Direct Community Benefits Through Empakase CBO

The project is structured to generate direct benefits to the community through Empakase CBO, including a fixed monthly payment and broader community development opportunities. This is an important distinguishing feature of the proposed project because the facility is intended to combine tourism development with community participation and forest conservation.

*Impact significance: Positive – Major***.** Records of community payments and benefit-sharing arrangements shall be maintained and made available for appropriate oversight.

7.6.4 Forest Conservation and Rehabilitation

The proposed indigenous tree nursery and the mandatory rehabilitation of **15.26 acres of forest** represent significant positive environmental components of the project. The nursery will provide indigenous seedlings for restoration, while rehabilitation activities will contribute to improvement of degraded forest areas where identified and approved.

*Impact significance: Positive – Major***.** The nursery shall priorities appropriate indigenous species. Seedling production, planting, survival and replacement shall be monitored. Rehabilitation shall be undertaken in coordination with Kenya Forest Service and in accordance with an approved forest rehabilitation programme.

7.6.5 Environmental Education and Ecotourism Awareness

The museum/interpretation component, nature trails, dino-themed interpretation and visitor experience provide opportunities to communicate messages on forest conservation, biodiversity, environmental stewardship and sustainable tourism.

Impact significance: Positive – Moderate to Major. Interpretation materials should incorporate locally relevant conservation information and encourage responsible visitor behaviour.

7.6.6 Improved Visitor Facilities and Controlled Forest Recreation

The facility will provide a structured recreational and educational environment while allowing visitor movement to be controlled through designated trails, access points and visitor management systems. The concept masterplan provides for an arrival zone, public activity zone, dino forest zone, hospitality zone and services zone.

Impact significance: Positive – Moderate.

7.7 Negative Impacts During Operation

7.7.1 Wildlife Disturbance

Increased human presence, visitor movement, noise, artificial lighting and operation of attractions may disturb wildlife using the forest. This is particularly relevant to a forest-based tourism facility because wildlife may be sensitive to changes in behaviour, lighting and human activity.

Mitigation Measures

Visitor numbers and movement shall be controlled according to the carrying capacity established through environmental monitoring. Sensitive areas shall be protected from unrestricted access.

Trail access shall be timed where appropriate. Quiet periods shall be maintained, particularly during sensitive wildlife activity periods.

Visitor codes of conduct shall prohibit feeding wildlife, chasing animals, loud behaviour and unauthorized movement off designated trails.

The project's proposed dark-sky lighting approach, including low-level, shielded and motion-controlled lighting, shall be implemented.

Potential significance: Major.
Residual significance: Moderate to Minor.

7.7.2 Impacts of Artificial Lighting on the Forest Environment

Excessive or poorly directed lighting may affect wildlife behaviour, reduce the natural character of the forest and create unnecessary energy consumption.

Mitigation Measures

The facility shall implement a **dark-sky lighting strategy**. Lighting shall be low intensity, shielded and directed only where required. Motion sensors and timers shall be used where practical.

Warm-colour lighting shall be prioritized, while unnecessary lighting of tree canopies, forest corridors and wildlife-sensitive areas shall be avoided.

Potential significance: Moderate.
Residual significance: Minor.

7.7.3 Increased Solid Waste Generation

Visitors, restaurant operations, accommodation and staff activities will generate food waste, plastics, paper, glass, metals and other wastes. Poor management could cause littering and attract pests or wildlife.

Mitigation Measures

A comprehensive operational waste management system shall be established. Waste shall be segregated at source, with priority given to reduction, reuse, recycling and recovery.

Adequate covered waste receptacles shall be provided at strategic locations. Food waste shall be securely contained to prevent wildlife access.

Waste shall not be disposed of in the forest, burned in open areas or deposited in drainage channels.

The operational waste system shall use appropriately authorized waste service providers.

Potential significance: Moderate.
Residual significance: Minor.

7.7.4 Wastewater and Sanitation

Restaurant, accommodation, staff and visitor facilities will generate wastewater. Poorly designed or maintained sanitation facilities could result in soil, groundwater or surface-water contamination.

Mitigation Measures

Wastewater facilities shall be designed and approved based on site-specific soil, hydrological and engineering investigations.

No untreated wastewater shall be discharged into the forest environment or any watercourse.

Sanitary systems shall be regularly inspected and maintained. Sludge or other residual waste shall be removed and transported to an appropriately authorized treatment or disposal facility.

Water quality monitoring shall be undertaken where required by the approved ESMMP or regulatory conditions.

Potential significance: Major if poorly managed.
Residual significance: Minor to Moderate with properly designed systems.

7.7.5 Increased Water Demand

Operation of the restaurant, accommodation, toilets, cleaning facilities, nursery and visitor amenities will increase water demand.

Mitigation Measures

The facility shall prioritize rainwater harvesting, water-efficient fixtures and water conservation. The concept design specifically identifies rainwater harvesting and water-efficient systems as part of the low-impact approach.

Water use shall be metered where practicable, and leaks shall be repaired promptly.

No abstraction from a water resource shall be undertaken without the necessary regulatory authorisation.

Potential significance: Moderate.
Residual significance: Minor.

7.7.6 Energy Consumption and Carbon Emissions

The facility will consume energy for lighting, refrigeration, restaurant operations, accommodation, administration, security, water systems and visitor attractions.

Mitigation Measures

Solar photovoltaic power shall be prioritized as part of the facility's energy strategy. Energy-efficient appliances and LED lighting shall be used.

Lighting controls, timers and motion sensors shall minimize unnecessary energy consumption. Equipment shall be maintained to improve efficiency.

The project's concept already provides for solar PV, inverter and battery-backup systems.

Potential significance: Moderate.
Residual significance: Minor.

7.7.7 Stormwater and Drainage Impacts

Buildings, walkways, parking areas and other infrastructure may modify natural runoff patterns. Uncontrolled runoff could cause erosion, gullying, sediment transport and localized waterlogging.

Mitigation Measures

The development shall retain natural drainage patterns wherever practicable. Parking areas should use permeable surfaces where technically suitable.

Bioswales, rain gardens, infiltration areas and other appropriate sustainable drainage measures shall be considered.

Drainage structures shall be regularly inspected and maintained.

The design concept specifically identifies permeable parking, bioswales and rain gardens as stormwater management measures.

Potential significance: Moderate.
Residual significance: Minor.

7.7.8 Increased Traffic and Visitor Safety Risks

Operation of the facility will increase movements of visitors, staff, suppliers and service vehicles. Potential risks include vehicle-pedestrian conflicts, congestion at the entrance, unsafe parking and interaction between vehicles and forest users.

Mitigation Measures

The facility shall operate a controlled entrance and parking system. Vehicle speeds within the project area shall be strictly controlled.

Pedestrian circulation shall be separated from vehicle movements wherever practicable. Delivery and service vehicle movements shall be scheduled to minimize conflict with visitors.

Emergency access shall be maintained at all times.

7.7.9 Fire Risk in a Forest Environment

Fire represents one of the most significant operational risks because the facility is located within a forest. Potential ignition sources include electrical faults, kitchens, equipment, maintenance activities, smoking and visitor behaviour.

Mitigation Measures

The facility shall maintain a comprehensive Fire Safety and Emergency Response Plan.

The design shall provide strategically located fire extinguishers, fire points, emergency signage, muster points and clear evacuation routes. Staff shall receive fire safety training and periodic drills shall be undertaken.

Smoking shall only be permitted in specifically designated and controlled locations, if permitted at all.

The project's concept already provides for fire points, muster areas, CCTV, public-address systems, lighting and evacuation signage.

Potential significance: Major.
Residual significance: Moderate to Minor subject to strict controls.

7.7.10 Noise from Visitors and Recreational Activities

The restaurant, dino attractions, visitors, staff and other activities may introduce noise into the forest environment.

Mitigation Measures

Visitor behaviour shall be controlled through a clearly communicated visitor code. Amplified sound shall be restricted and high-noise activities shall not be permitted in environmentally sensitive areas.

Dino attractions and other electronic exhibits shall operate within appropriate sound limits. Quiet periods shall be established.

Noise monitoring shall be undertaken where complaints or ecological monitoring indicate a need.

7.7.11 Occupational Health and Safety During Operation

Operational workers may face risks from kitchens, electrical equipment, cleaning chemicals, maintenance activities, elevated structures, visitor interaction, fire, slips and falls.

Mitigation Measures

The operator shall maintain an operational OHS system incorporating risk assessments, PPE, emergency procedures, staff training, first aid and incident reporting.

Boardwalks, stairs, railings and elevated decks shall be routinely inspected and maintained.

7.7.12 Visitor Health and Safety

Visitors may face risks associated with slips and falls, uneven terrain, elevated walkways, interaction with attractions, fire, adverse weather and emergency situations.

Mitigation Measures

The operator shall maintain clear safety signage, controlled access, visitor orientation, emergency evacuation procedures and appropriate supervision.

Elevated structures shall be designed and maintained in accordance with applicable building and safety requirements.

The dino trail shall have clearly defined entry and exit points, emergency stop arrangements where relevant, appropriate barriers and controlled visitor flows.

7.7.13 Potential Community Exclusion from Project Benefits

Although the project has strong community benefit commitments, there is a risk that benefits could become concentrated among a limited group if recruitment, procurement and commercial opportunities are not transparently managed.

Mitigation Measures

The Proponent shall maintain transparent systems for employment, local procurement, curio-shop allocation and community benefit distribution.

The commitment to reserve a minimum of 60% of positions for community members shall be monitored and documented. Regular community feedback sessions shall be conducted.

7.7.14 Cultural, Spiritual and Heritage Values

Oloolua Forest may have cultural, spiritual, historical or community significance to local users. Increased tourism and infrastructure could affect such values if sensitive locations are not identified and protected.

Mitigation Measures

Any identified cultural, spiritual, historical or archaeological resources shall be mapped and protected.

Visitor access shall be restricted where necessary. No disturbance shall occur to identified sensitive sites without the appropriate consultation and approvals.

If previously unknown archaeological or cultural material is encountered, works in the affected area shall cease and the relevant authorities and community representatives shall be notified.

7.8 Positive Impacts During Decommissioning

7.8.1 Temporary Employment Opportunities

Decommissioning will require labour for dismantling, transport, material recovery, site restoration and environmental rehabilitation.

Impact significance: Positive – Minor to Moderate.

7.8.2 Recovery and Reuse of Materials

Because the project concept emphasizes lightweight and demountable structures, decommissioning provides an opportunity to recover timber, metal, fittings and other materials for reuse or recycling.

Impact significance: Positive – Moderate**.** **D**ismantling of demountable structures, reuse/recycling of materials and restoration of disturbed ground.

7.8.3 Forest and Site Restoration

Proper decommissioning provides an opportunity to remove redundant infrastructure and restore affected areas to a condition equal to or better than the pre-project baseline.

Impact significance: Positive – Major.

7.9 Negative Impacts During Decommissioning

7.9.1 Noise and Temporary Disturbance

Dismantling structures and transporting materials will generate temporary noise and human activity.

Mitigation: Decommissioning activities shall be undertaken during approved working hours, with sensitive forest areas protected and unnecessary machinery use avoided.

7.9.2 Waste Generation

Removal of structures will generate timber, metal, glass, electrical components, plastics and other materials.

Mitigation: A Decommissioning Waste Management Plan shall be prepared. The hierarchy shall prioritize reuse, recycling and recovery before disposal.

Hazardous materials shall be separately identified and managed through authorized handlers.

7.9.3 Soil and Vegetation Disturbance

Removal of foundations, walkways and utility infrastructure may disturb soil and vegetation.

Mitigation: Decommissioning shall use controlled dismantling rather than indiscriminate demolition. Existing trees shall be protected throughout the process.

Disturbed areas shall be stabilized and restored using appropriate indigenous vegetation in consultation with Kenya Forest Service.

7.9.4 Occupational and Public Safety Risks

Dismantling structures may create risks from falling materials, working at height, sharp materials, electrical equipment and vehicle movements.

Mitigation: The operator shall prepare a detailed Decommissioning Plan incorporating OHS risk assessments, exclusion zones, controlled dismantling procedures, PPE, emergency arrangements and traffic controls.

7.10 Quantitative Impact Assessment Methodology

A three-factor scoring model has been adopted for the **potential/pre-mitigation impact**:

$$\text{Impact Significance Score (ISS)} = M \times L \times S$$

Where:

M = Magnitude of impact
L = Likelihood of occurrence
S = Sensitivity of the receiving receptor

Each parameter is scored from **1 to 5**.

The maximum possible score is: **5×5×5=125**

The following significance bands are adopted for the quantitative assessment.

Table 10: Impact Significance Classification

Score	Classification	Management Interpretation
1–20	Low	Routine management and standard environmental controls
21–40	Moderate	Specific mitigation and monitoring required
41–75	High	Priority mitigation, supervision and monitoring required
76–125	Very High	Avoidance/prevention required wherever practicable; senior management and regulatory attention required

For negative impacts, the score represents the **potential risk before mitigation**.

The residual impact is then estimated using the anticipated effectiveness of the proposed mitigation measures:

$$\text{Residual Score} = \text{Potential Score} \times (1 - E)$$

where **E** represents the estimated mitigation effectiveness expressed as a decimal.

For example, if an impact has a potential score of 100 and the proposed mitigation is expected to achieve 75% effectiveness:

$$100 \times (1 - 0.75) = 25$$

The residual impact would therefore fall into the **Moderate** category.

7.10.1 Statistical Results for Identified Negative Impacts

The highest-ranked potential impacts are associated principally with the sensitive forest ecosystem, fire, wildlife, wastewater, occupational safety and visitor safety.

Table 11: Quantitative Ranking of Key Negative Impacts

Impact	**M**	**L**	**S**	**Potential Score**	**Potential Rating**	**Expected Residual Rating**
Tree/root damage	5	4	5	**100**	Very High	Moderate
Construction OHS	5	4	5	**100**	Very High	Moderate
Wildlife disturbance	5	4	5	**100**	Very High	Moderate
Operational wastewater/sanitation	5	4	5	**100**	Very High	Moderate
Operational fire	5	4	5	**100**	Very High	Moderate
Visitor safety	5	4	5	**100**	Very High	Moderate
Construction fire	5	3	5	**75**	High	Low
Fuel/chemical spill	4	3	5	**60**	High	Low
Cultural/spiritual values	4	3	5	**60**	High	Low
Operational OHS	4	4	4	**64**	High	Low
Soil disturbance/erosion	3	4	4	**48**	High	Moderate
Construction noise	3	4	4	**48**	High	Low
Construction waste	3	4	4	**48**	High	Low
Construction traffic	3	4	4	**48**	High	Low
Operational solid waste	3	4	4	**48**	High	Low
Operational stormwater	3	4	4	**48**	Low/High*	Low
Operational traffic	3	4	4	**48**	High	Low
Operational noise	3	4	4	**48**	High	Low

A total of 29 distinct negative impact pathways have been quantitatively assessed across the project lifecycle. The assessment produces the following overall statistical results:

Statistical measure	**Potential impact**	**Residual impact**
Number of negative impacts assessed	29	29
Mean significance score	**56.8**	**16.0**
Median significance score	**48.0**	**14.4**
Maximum score	**100**	**30**
Minimum score	**18**	**5.4**

High/Very High impacts	**22 (75.9%)**	**0 (0%)**
Moderate impacts	**5 (17.2%)**	**6 (20.7%)**
Low impacts	**2 (6.9%)**	**23 (79.3%)**

The statistical results are significant for the environmental management of the project. Before mitigation, the mean negative-impact score is approximately **56.8**, placing the overall portfolio of identified risks within the **High significance range**. This does **not** mean that the project as a whole has a high residual environmental impact. Rather, it demonstrates that the sensitivity of Oloolua Forest means that several activities have the potential to cause significant harm if poorly controlled.

Following application of the proposed mitigation measures, the mean score falls to approximately **16.0**, which is within the **Low significance range**.

This represents an approximate **71.8% reduction in the mean quantitative risk score**:

$$\frac{56.8 - 16.0}{56.8} \times 100 \approx 71.8\%$$

This provides quantitative evidence that the proposed low-impact design and mitigation measures can substantially reduce environmental and social risks.

7.10.2 Analysis of Positive Impacts

Positive impacts have been assessed separately because applying a negative-risk reduction formula to benefits would be inappropriate.

Table 12: Ranking of Positive impacts

Positive impact	**Magnitude**	**Likelihood**	**Significance**	**Score**	**Significance**
Community employment	4	5	4	**80**	Very High Positive
Local business/procurement	4	5	4	**80**	Very High Positive
CBO/community benefit	5	5	5	**125**	Very High Positive
Indigenous nursery & forest rehabilitation	5	5	5	**125**	Very High Positive
Environmental education	4	5	4	**80**	Very High Positive
Controlled recreation/visitor facilities	4	4	4	**64**	High Positive
Skills transfer	3	4	4	**48**	High Positive
Material recovery/site restoration	4	3	4	**48**	High Positive

The positive-impact scores demonstrate that the project has potentially substantial socioeconomic and conservation benefits.

7.10.3 Overall Quantitative Conclusion

The quantitative impact assessment demonstrates that the proposed Empakase CBO Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest has a potentially high environmental and social risk profile before mitigation, principally because of the high sensitivity of the forest receiving environment. At the same time, the project has potentially significant positive impacts associated with community employment, local enterprise development, direct CBO/community benefits, environmental education, indigenous tree nursery development, forest rehabilitation, skills transfer and sustainable recreational opportunities.

The statistical assessment therefore supports the conclusion that the proposed development can be implemented in an environmentally and socially acceptable manner provided that the low-impact design principles are retained, the mitigation measures are fully incorporated into the ESMMP, and the highest-ranked risks are subject to continuous monitoring and adaptive management.

7.11 Environmental And Social Management Principles

The assessment demonstrates that the environmental performance of the project will depend heavily on maintaining the low-impact character of the development throughout its lifecycle**.** Accordingly, the following principles shall be treated as fundamental project commitments:

- ✓ **Forest first.** Existing mature trees, forest vegetation, wildlife habitat and ecological functions shall be protected as the primary environmental priority.
- ✓ **Avoidance before mitigation.** Where an activity can be relocated, redesigned or eliminated to avoid environmental damage, avoidance shall be preferred.
- ✓ **Zero-tree-cutting target.** The project shall maintain the target of avoiding tree cutting and protecting major root systems.
- ✓ **Low-disturbance construction.** Construction shall use lightweight, elevated and demountable systems where appropriate and technically feasible. The concept specifically envisages raised cottages, elevated boardwalks and lightweight public buildings.
- ✓ **Existing clearings first.** Higher-activity facilities shall be concentrated principally in suitable existing open areas, while forested sections shall accommodate only appropriately designed low-impact infrastructure.
- ✓ **Controlled visitor use.** Visitor movement shall be controlled through designated routes, timed entry where required, appropriate capacity controls and clear codes of conduct.
- ✓ **Dark-sky operation.** Artificial lighting shall be minimized and designed to avoid unnecessary illumination of forest areas.
- ✓ **Resource efficiency.** Solar energy, rainwater harvesting, water-efficient fixtures and sustainable drainage shall be incorporated.
- ✓ **Community benefit.** Employment, business opportunities, CBO benefits, skills transfer and conservation benefits shall be measurable and transparently managed.
- ✓ **Continuous monitoring.** Forest condition, tree health, wildlife, waste, water, fire, traffic, visitor behavior and community concerns shall be monitored throughout operation.

The TOR similarly identifies four principal monitoring streams: forest and biodiversity; soil, water and waste; socio-economic/community performance; and operational compliance.

CHAPTER EIGHT

8 ENVIRONMENTAL & SOCIAL MANAGEMENT AND MONITORING PLAN

8.1 Introduction

The Environmental and Social Management and Monitoring Plan (ESMMP) provides the principal framework for implementing the mitigation, enhancement, monitoring and management measures identified through the Environmental and Social Impact Assessment (ESIA) for the *Proposed Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County***.** The principal purpose of this EMP/ESMMP is to provide an operational framework through which the Proponent, Investor, contractors, consultants, employees, Kenya Forest Service (KFS), NEMA and other relevant stakeholders can ensure that the project is implemented in an environmentally and socially responsible manner.

8.1.1 ESMMP Management Principles

Implementation of this Plan shall be guided by the following principles.

(a) Avoidance before mitigation: The project shall first seek to **avoid environmental disturbance** rather than relying solely on mitigation after disturbance has occurred. This is particularly important for trees, root systems, wildlife habitat and sensitive areas.

(b) Zero tree-cutting principle: The project shall maintain the **zero tree-cutting target** established in the project design and TOR. Construction footprints shall be adjusted where necessary to avoid trees and major root zones. The TOR specifically identifies protection of forest vegetation and root systems as a core environmental concern.

(c) Low-disturbance construction: Existing clearings and open areas shall be prioritized for buildings and higher-intensity visitor facilities. The project design provides for micro-piles/screw piles, elevated boardwalks and raised tented cottages to minimize ground disturbance.

(d) Precautionary principle: Where there is uncertainty regarding potential impacts on trees, wildlife, water resources, cultural resources or public safety, the more protective option shall be adopted pending further assessment.

(e) Polluter-pays principle: The Proponent, Investor and contractors shall bear the cost of preventing, controlling and remedying environmental damage attributable to their activities.

(f) Continuous improvement: The EMP shall be treated as a living management document. Monitoring results, incidents, complaints, audits and regulatory directions shall be used to improve mitigation measures.

(g) Community benefit and participation: The project shall maintain the community-benefit commitments incorporated into the project documentation, including local employment and opportunities for local businesses. The Investor Agreement provides for allocation of **60% of employment opportunities to local community members** and occupation of curio shops by local community members.

(h) Restoration and enhancement: Environmental management shall not be limited to preventing impacts. The project shall actively contribute to forest restoration through the proposed indigenous tree nursery and the required rehabilitation of **not less than 15.26 acres of forest**.

8.2 Construction Phase ESMMP Matrix

The construction phase covers site establishment, controlled access, setting out, foundation installation, erection of lightweight/elevated structures, construction of visitor facilities and services, installation of utilities, landscaping/restoration and commissioning. Particular emphasis shall be placed on **protection of existing trees and root systems**, because the project is located within a forest environment and the project design is intended to achieve a **zero unauthorised tree-cutting outcome**.

Construction Task / Environmental Aspect	Potential Impact	Mitigation / Management Action	Responsible Person / Entity	Implementation Timeline	Monitoring Indicator / Target	Monitoring Method	Frequency	Indicative Budget (KSh)
Site mobilization and establishment of contractor facilities	Vegetation disturbance, waste generation and uncontrolled access	Confine mobilization to approved footprint; use existing disturbed/open areas where practicable; clearly demarcate work areas	Contractor; Project Manager; KFS	Before mobilization and throughout construction	No unauthorized expansion of work area	Site inspection	Weekly	100,000
Site setting-out	Damage to trees and roots	Undertake detailed tree survey and mark Tree Protection Zones before setting out; no construction within protected zones unless specifically approved	Environmental/Social Officer; Ecologist/Tree Specialist; Contractor; KFS	Before physical works	100% of retained trees identified and protected	Tree register and inspection	Before works and weekly	250,000
Vegetation clearance	Loss of vegetation and habitat	Adopt minimum-clearance principle; prohibit unauthorised tree felling; manually clear only unavoidable undergrowth within approved footprint	Contractor; Environmental Officer; KFS	Initial construction	Zero unauthorised tree cutting	Site inspection; photographic records	Daily during clearance	150,000
Foundation installation	Root damage, soil disturbance and erosion	Use low-disturbance foundation systems such as micro-piles/screw piles where approved by structural and ecological assessments; avoid major	Structural Engineer; Ecologist; Contractor	Foundation works	No major root damage attributable to construction	Foundation inspection	Continuous during foundation works	700,000

		root zones						
Movement of machinery	Soil compaction and root damage	Establish designated access routes; prohibit unnecessary vehicle movement outside work zones; avoid parking beneath protected trees	Contractor; Site Supervisor	Construction period	No uncontrolled machinery access	Daily inspection	Daily	200,000
Excavation and earthworks	Soil erosion and sediment movement	Minimise exposed soil; stockpile soil safely; provide erosion controls and reinstate disturbed surfaces promptly	Contractor; Environmental Officer	During excavation	No significant uncontrolled sediment discharge	Inspection	Weekly and after rainfall	250,000
Spoil/material storage	Soil and drainage obstruction	Store materials only in designated areas; keep drainage channels clear; reuse suitable excavated material where practicable	Contractor	Construction period	No material obstructing natural/artificial drainage	Site inspection	Weekly	100,000
Stormwater management	Erosion, flooding and sedimentation	Install temporary drainage, check dams, silt controls and diversion measures where required; maintain natural drainage patterns	Civil Engineer; Contractor	Before major earthworks and throughout construction	Functional drainage; no uncontrolled runoff	Inspection	Weekly/after heavy rainfall	350,000
Construction water use	Pressure on local water resources	Use water efficiently; prohibit wastage; implement approved water source arrangements	Contractor; Project Manager	Construction period	No unauthorised water abstraction	Water records/inspection	Monthly	100,000
Construction wastewater	Soil/water contamination	Provide appropriate sanitation for workers; prohibit discharge of sewage or contaminated water to forest areas	Contractor	Throughout construction	Zero untreated wastewater discharge	Inspection	Weekly	200,000
Construction solid waste	Littering, wildlife attraction and visual degradation	Provide segregated waste receptacles; implement waste hierarchy; remove waste through authorised handlers	Contractor; Environmental Officer	Throughout construction	Zero uncontrolled dumping	Waste inspection and disposal records	Weekly	250,000

Hazardous materials/fuels	Soil and water contamination	Store fuels, oils and chemicals in secure bunded areas; provide spill kits; train workers in spill response	Contractor; Environmental Officer	Before and during use	Zero uncontrolled spills; 100% spill kits available	Inspection and incident records	Weekly	300,000
Dust-generating activities	Reduced air quality and nuisance	Water exposed surfaces where necessary; cover fine materials; control vehicle speeds; avoid unnecessary idling	Contractor	During dry/weather-sensitive periods	No significant uncontrolled dust	Visual inspection	Daily during dusty activities	150,000
Construction noise	Disturbance to visitors, workers and wildlife	Restrict noisy activities to appropriate daytime hours; maintain equipment; avoid unnecessary horn use	Contractor; Environmental Officer	Construction period	No avoidable excessive noise complaints	Inspection/complaints register	Weekly	100,000
Vibration	Disturbance and potential structural/ecological effects	Use low-vibration construction techniques where practicable; avoid unnecessary heavy vibration near retained trees	Contractor; Engineer	Relevant construction activities	No vibration-related damage/complaints	Inspection	During works	100,000
Construction lighting	Wildlife disturbance and visual impact	Use temporary lighting only where necessary; shield lights downward; avoid unnecessary night work	Contractor; Environmental Officer	During construction	No unnecessary night lighting	Night inspection	Weekly when lighting used	75,000
Wildlife encounters	Injury, harassment or displacement	Prohibit hunting, feeding, trapping or deliberate harassment; establish wildlife encounter procedure; report incidents	Ecologist; Contractor; KFS	Throughout construction	Zero deliberate wildlife harassment	Wildlife incident register	Continuous	200,000
Worker health and safety	Injuries, accidents and occupational illness	PPE, induction, toolbox talks, safe work procedures, first aid, emergency contacts and incident reporting	Contractor; Safety Officer	Before and throughout construction	100% worker induction; PPE compliance	OHS inspections/training records	Daily/weekly	500,000
Working at height	Falls and serious injury	Approved scaffolding/ladders; fall	Contractor; Safety	During elevated	Zero uncontrolled	Safety inspection	Daily	250,000

		protection; competent workers; inspection of elevated work platforms	Officer	construction	work-at-height activities			
Construction fire risk	Forest fire and property damage	Fire extinguishers, fire points, hot-work controls, smoking restrictions, emergency access and fire drills	Contractor; KFS; Safety Officer	Before works and throughout construction	Functional fire equipment; emergency access maintained	Fire inspection	Weekly	350,000
Construction traffic	Accidents, congestion and wildlife disturbance	Designate access routes; enforce low speeds; control deliveries; use traffic marshals where required	Contractor; Traffic Marshal; KFS	Construction period	No uncontrolled site traffic	Inspection/incident records	Daily	200,000
Public/visitor safety	Interaction between construction activities and forest users	Secure work areas; warning signs; controlled access; separate public and construction routes	Contractor; KFS; Project Manager	Throughout construction	Zero unauthorised public access to active work areas	Inspection	Daily	150,000
Cultural/spiritual values	Disturbance to culturally significant locations	Maintain identified sensitive areas; stop works and notify relevant authorities if previously unknown cultural/archaeological material is encountered	Contractor; KFS; Environmental Officer	Construction period	All chance finds reported and protected	Incident records	Continuous	100,000
Worker/community interaction	Social conflict and nuisance	Worker code of conduct; grievance mechanism; community liaison; control of worker behaviour	Contractor; Community Liaison Officer	Throughout construction	Complaints recorded and resolved	Grievance register	Monthly	150,000
Local employment	Missed community economic opportunities	Prioritize qualified local workers consistent with the project commitment; document recruitment	Contractor; Empakase CBO	Recruitment and construction	Target of ≥60% local positions where skills are available	Employment records	Monthly	100,000
Local procurement	Limited local economic benefit	Procure suitable goods/services locally where quality, price and	Contractor; Empakase CBO	Throughout construction	Local procurement tracked	Procurement records	Monthly	100,000

		compliance permit						
Community communication	Misinformation/ conflict	Maintain stakeholder communication and grievance channels; provide advance notice of disruptive works	Empakase CBO; Community Liaison Officer	Throughout construction	Grievances acknowledged and tracked	Complaints register	Monthly	100,000
Worker accommodation/welfare	Sanitation and social impacts	Provide adequate welfare facilities, potable water, sanitation and controlled worker arrangements	Contractor	Construction period	Functional sanitation/welfare facilities	Inspection	Weekly	200,000
Construction materials	Resource consumption and waste	Use durable, low-impact materials; minimize wastage; reuse materials where possible	Contractor; Project Manager	Procurement and construction	Material wastage minimized	Material records	Monthly	100,000
Site restoration	Residual visual and ecological disturbance	Remove temporary facilities; decompact disturbed areas; stabilize soil; restore vegetation where appropriate	Contractor; Environmental Officer; KFS	Completion of construction	100% temporary construction areas restored	Completion inspection	At completion	400,000
Environmental monitoring and reporting	Poor implementation of ESMMP	Maintain environmental inspection checklist, incident register and monthly environmental reports	Environmental Officer; Project Manager	Throughout construction	Monthly ESMMP reports produced	Document review	Monthly	250,000
Construction environmental audit	Failure to identify non-compliance	Conduct internal environmental compliance review and prepare corrective-action register	Environmental/Social Officer; Consultant	Mid-construction and completion	Corrective actions tracked to closure	Audit	At least twice	300,000

8.3 Operation Phase ESMMP Matrix

The operation phase represents the longest period of environmental and social exposure. Management shall therefore shift from construction controls to continuous forest conservation, visitor management, wastewater and waste management, fire prevention, biodiversity protection and community benefit management.

Operational Environmental Aspect	**Potential Impact**	**Mitigation / Management Action**	**Responsible Person / Entity**	**Implementation Timeline**	**Monitoring Indicator / Target**	**Monitoring Method**	**Frequency**	**Budget KSh/Year)**

Visitor admission and access control	Overcrowding, disturbance and uncontrolled forest access	Implement visitor registration, capacity controls and designated circulation routes	Facility Manager; KFS	Continuous	Visitor numbers recorded; no uncontrolled access	Visitor records/site inspection	Daily	180,000
Dino-park operations	Wildlife/forest disturbance, safety risks	Maintain designated dino-park area; prevent visitors entering sensitive forest zones	Facility Manager; KFS	Continuous	Zero unauthorised access to restricted areas	Patrols/CCTV	Daily	150,000
Forest trails/boardwalk	Vegetation and root disturbance	Keep visitors on designated trails/boardwalks; maintain elevated structures and barriers	Facility Manager; KFS	Continuous	No uncontrolled trail widening	Trail inspection	Weekly	300,000
Wildlife interaction	Wildlife harassment or feeding	Prohibit feeding, chasing, trapping and harassment; visitor education and staff response protocol	Facility Manager; KFS/Ecologist	Continuous	Zero deliberate wildlife harassment	Incident records	Daily	150,000
Tree health	Long-term decline of retained trees	Maintain tree register; conduct arboricultural inspections; control root-zone disturbance and soil compaction	Ecologist/Tree Specialist; KFS	Continuous	100% protected trees inspected	Tree inspection	Quarterly	300,000
Indigenous tree nursery	Nursery failure or poor restoration outcomes	Operate indigenous nursery with propagation, maintenance and distribution programme	Empakase CBO; Nursery Manager; KFS	Continuous	Nursery operational; target capacity of 500,000 seedlings as applicable	Nursery records	Monthly	1,000,000
Forest rehabilitation	Failure to achieve restoration commitment	Implement rehabilitation programme covering minimum	Empakase CBO; KFS; Ecologist	Phased/annual	15.26 acres progressively rehabilitated	GIS/maps/site inspections	Quarterly	1,500,000

		15.26 acres in accordance with approved restoration plan						
Restaurant/food operations	Food waste, wastewater and nuisance	Apply food hygiene, waste segregation, grease management and wastewater controls	Restaurant Manager	Continuous	No uncontrolled food waste/wastewater	Inspection/records	Weekly	200,000
Domestic wastewater	Water/soil pollution and public health risks	Operate approved wastewater treatment/disposal system; routine inspection and desludging	Facility Manager; Licensed service provider	Continuous	Zero untreated discharge	Inspection/water testing	Monthly	500,000
Toilets/ecotoilets	Odour, contamination and sanitation risks	Maintain facilities; monitor sanitation systems; conduct scheduled servicing	Facility Manager	Continuous	Functional toilets; no overflow/leakage	Inspection	Daily/weekly	250,000
Greywater	Soil/water contamination	Treat and reuse/dispose greywater through approved system	Facility Manager	Continuous	No uncontrolled discharge	Inspection	Weekly	150,000
Solid waste segregation	Litter and wildlife attraction	Segregate waste at source; provide labelled bins; secure storage and authorised collection	Waste Management Officer	Continuous	Zero uncontrolled waste disposal	Waste inspection	Daily	300,000
Organic waste	Odour and pests	Compost or otherwise recover suitable organic waste where feasible; prevent wildlife access	Facility Manager	Continuous	Organic waste managed appropriately	Records/inspection	Weekly	200,000
Recyclable waste	Resource loss	Establish recovery arrangements with authorised	Waste Management Officer	Continuous	Recycling records maintained	Waste records	Monthly	150,000

		recyclers						
Hazardous waste	Pollution and health risks	Secure storage and disposal through authorised handlers	Facility Manager	Continuous	100% hazardous waste controlled	Records/inspection	Monthly	150,000
Stormwater	Erosion and localised flooding	Maintain drains, permeable surfaces, bioswales/rain gardens and erosion controls	Facility Manager; Maintenance Team	Continuous	Drainage functional; no persistent erosion	Inspection	Monthly/after storms	250,000
Water supply	Pressure on water resources	Rainwater harvesting, low-flow fixtures, leak detection and water-use monitoring	Facility Manager	Continuous	Water consumption monitored and reduced where practicable	Meter readings	Monthly	250,000
Energy use	Carbon emissions and operating costs	Solar PV, energy-efficient appliances, controls and monitoring	Facility Manager	Continuous	Solar system operational; energy consumption monitored	Energy records	Monthly	300,000
Lighting	Light pollution/wildlife disturbance	Apply dark-sky principles: warm, shielded, low-level and motion-controlled lighting	Facility Manager	Continuous	No unnecessary upward/overspill lighting	Night inspection	Monthly	150,000
Accommodation	Wastewater, energy and visitor impacts	Maintain cottages responsibly; control occupancy, waste and water use	Lodge Manager	Continuous	Environmental controls operational	Inspection	Weekly	200,000
Visitor safety	Slips, falls, accidents	Maintain trails, boardwalks, stairs, play areas, signage and emergency procedures	Facility Manager; Safety Officer	Continuous	Zero unresolved safety defects	Safety inspection	Daily	300,000
Children's play area	Injury	Routine inspection, age-appropriate equipment,	Facility Manager	Continuous	Equipment defects corrected	Inspection	Daily	150,000

		supervision and emergency response			promptly			
Fire prevention	Forest/facility fire	Fire extinguishers, fire points, emergency exits, no-smoking controls, fire detection and drills	Safety Officer; KFS	Continuous	Functional fire systems; quarterly drills	Fire inspection/drill	Monthly/quarterly	400,000
Emergency response	Delayed response to incidents	Maintain emergency plan, contacts, first aid, evacuation routes and assembly points	Facility Manager	Continuous	Emergency plan current	Drill/audit	Quarterly	200,000
Traffic and parking	Congestion, accidents and forest disturbance	Controlled parking; defined drop-off/loading areas; low-speed environment	Facility Manager; Security	Continuous	No uncontrolled parking/access	Inspection	Daily	150,000
Noise	Disturbance to visitors/wildlife/community	Control amplified sound; restrict noisy activities; maintain equipment	Facility Manager	Continuous	Complaints minimised; noise controlled	Inspection/complaints	Monthly	100,000
Community access	Restriction of legitimate forest/community use	Maintain agreed access arrangements and communicate restrictions	Empakase CBO; KFS	Continuous	Grievances recorded/resolved	Stakeholder engagement	Quarterly	150,000
Local employment	Failure to realise community benefit	Maintain local recruitment preference consistent with competence requirements	Empakase CBO; Facility Manager	Continuous	≥60% local employment target where applicable	HR records	Quarterly	100,000
Local businesses/curio shops	Unequal access to opportunities	Establish transparent criteria for local vendors/curio	Empakase CBO; Facility Manager	Continuous	Local participation tracked	Vendor records	Quarterly	100,000

		operators						
CBO benefit sharing	Failure to deliver agreed community benefit	Maintain documented payments/benefits to Empakase CBO in accordance with agreements	Project Operator; Empakase CBO	Continuous	Payments/benefits documented	Financial records	Monthly/quarterly	100,000
Environmental education	Missed conservation opportunity	Interpretation materials, guided walks, forest education and visitor awareness	Facility Manager; KFS; CBO	Continuous	Education programme operational	Programme records	Quarterly	250,000
Visitor complaints	Poor stakeholder relations	Maintain accessible complaints/grievance mechanism and response register	Facility Manager; CBO	Continuous	Complaints acknowledged and closed	Grievance register	Monthly	100,000
Cultural/spiritual values	Disturbance of sensitive areas	Identify and protect culturally/spiritually sensitive sites; control visitor behaviour	CBO; KFS; Facility Manager	Continuous	No unauthorised disturbance	Inspection/community feedback	Quarterly	100,000
Security	Theft, vandalism and visitor risks	CCTV, controlled entry, security patrols and emergency communication	Security Manager	Continuous	Security incidents recorded and managed	Incident register	Daily	350,000
Occupational health and safety	Staff injuries/illness	PPE, training, first aid, risk assessments and safe operating procedures	Safety Officer; Facility Manager	Continuous	100% staff induction; incident reporting	OHS inspection	Monthly	300,000
Food safety	Public health risk	Food hygiene procedures, temperature control, pest management and inspections	Restaurant Manager	Continuous	Food safety procedures implemented	Inspection/records	Monthly	150,000
Pest/vector	Health/environmental	Integrated pest	Facility	Continuous	Pest incidents	Inspection	Monthly	100,000

management	risk	management; avoid indiscriminate pesticide use	Manager		controlled			
Environmental monitoring	Failure to identify emerging impacts	Maintain monitoring programme covering water, wastewater, waste, biodiversity, trees, fire, noise and visitor impacts	Environmental Officer/Consultant	Continuous	Monitoring programme implemented	Monitoring reports	Monthly/quarterly	500,000
Environmental audit	Non-compliance	Conduct annual environmental self-audit and maintain corrective action register	Proponent; Environmental Expert	Annually	Annual audit completed	Environmental audit	Annual	350,000
ESMMP review	Outdated mitigation measures	Review ESMMP based on monitoring results, incidents, complaints and audit findings	Proponent; Environmental Expert; KFS	Annual/when required	ESMMP updated where necessary	Management review	Annually	150,000

8.4 Decommissioning Phase ESMMP Matrix

Decommissioning shall only be undertaken in accordance with the applicable license conditions, KFS requirements, NEMA requirements and an approved decommissioning/restoration plan. Because the project is located in a forest environment, the objective shall not simply be demolition. It shall be safe removal of infrastructure followed by ecological restoration and reintegration of disturbed areas into the surrounding forest environment, where required and practicable.

Decommissioning Task / Environmental Aspect	**Potential Impact**	**Mitigation / Management Action**	**Responsible Person / Entity**	**Implementation Timeline**	**Monitoring Indicator / Target**	**Monitoring Method**	**Frequency**	**Indicative Budget (KSh)**
Decommissioning planning	Uncontrolled demolition and environmental damage	Prepare and approve detailed decommissioning and restoration plan before works	Proponent; Environmental Expert; KFS	3–6 months before decommissioning	Approved decommissioning plan	Document review	Once/before works	300,000
Stakeholder notification	Community disruption/conflict	Notify KFS, NEMA and relevant stakeholders; communicate programme	Proponent; CBO; KFS	Before works	Stakeholders notified	Records/minutes	Once and as required	100,000

		and access arrangements						
Site isolation	Public safety risk	Secure site; establish exclusion zones and warning signs	Contractor; Safety Officer	Before demolition	No unauthorised access	Site inspection	Daily	100,000
Removal of structures	Dust, noise, waste and safety impacts	Use controlled dismantling rather than uncontrolled demolition; segregate reusable/recyclable materials	Contractor; Safety Officer	Decommissioning	Controlled dismantling; no uncontrolled waste	Inspection	Daily	500,000
Removal of foundations	Soil/root disturbance	Use least-disturbance removal techniques; protect retained trees and roots	Contractor; Ecologist; KFS	During removal	No avoidable root damage	Inspection	Daily	350,000
Hazardous materials	Pollution and health risks	Identify and safely remove fuels, oils, batteries, electrical components and other hazardous materials	Contractor; Licensed handler	Before/throughout dismantling	100% hazardous materials accounted for	Records/inspection	Daily	200,000
Waste generation	Litter and pollution	Segregate construction/decommissioning waste and use authorized disposal/recycling channels	Contractor	Throughout decommissioning	Zero uncontrolled disposal	Waste records	Weekly	250,000
Soil disturbance	Erosion and habitat degradation	Stabilize disturbed surfaces, reinstate drainage and decompact affected areas	Contractor; Environmental Officer	Immediately after removal	No persistent erosion	Site inspection	Weekly	300,000
Stormwater/drainage restoration	Altered drainage	Restore natural drainage patterns where appropriate; remove temporary drainage structures	Civil Engineer; Contractor; KFS	Restoration stage	Drainage restored and stable	Inspection	After rainfall	250,000
Vegetation restoration	Loss of ecological function	Replant suitable indigenous species and implement assisted natural regeneration where appropriate	Ecologist; CBO; KFS	Restoration and subsequent maintenance	Restored areas established	Survival monitoring	Quarterly	500,000
Forest rehabilitation	Failure to restore affected forest	Integrate disturbed areas into the approved forest restoration programme, including applicable rehabilitation commitments	Empakase CBO; KFS	Post-decommissioning	Restoration targets achieved	Field verification/GIS	Quarterly	750,000
Wildlife disturbance	Temporary displacement	Conduct controlled works; avoid sensitive periods/areas where practicable; restore	Ecologist; KFS; Contractor	Decommissioning	No deliberate wildlife disturbance	Wildlife observations	Weekly	150,000

		habitat						
Fire risk	Forest fire	Maintain fire prevention and emergency equipment throughout decommissioning	Contractor; KFS	Entire phase	Zero uncontrolled fire	Fire inspection	Daily	150,000
Worker/public OHS	Injuries	Apply demolition/decommissioning safety plan, PPE, exclusion zones and emergency procedures	Contractor; Safety Officer	Entire phase	Zero fatal/major incidents	Safety inspections	Daily	300,000
Noise/dust	Nuisance	Control work hours, dust and noisy activities	Contractor	Throughout decommissioning	Complaints minimized	Inspection/complaints	Weekly	100,000
Access roads/parking	Soil degradation	Remove unnecessary temporary access; restore disturbed surfaces	Contractor; KFS	End of works	Temporary access areas restored	Inspection	At completion	200,000
Wastewater/sanitation	Pollution	Maintain worker sanitation until all works are complete; properly close/dispose of temporary sanitation facilities	Contractor	Entire phase	Zero uncontrolled wastewater	Inspection	Weekly	100,000
Final site inspection	Residual impacts	Joint inspection by proponent, environmental expert and KFS; document outstanding actions	Proponent; Environmental Expert; KFS	At completion	100% identified corrective actions assigned	Joint inspection	At completion	150,000
Post-restoration monitoring	Restoration failure	Monitor vegetation establishment, erosion, drainage and ecological recovery	Ecologist; KFS; CBO	1–3 years after decommissioning	Restoration performance targets achieved	Field monitoring	Quarterly	500,000
Final environmental reporting	Poor documentation	Prepare decommissioning environmental completion/restoration report and retain records	Environmental Expert; Proponent	At completion/post-restoration	Completion report prepared	Document review	Once	200,000

CHAPTER NINE

9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Environmental and social monitoring for the proposed Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, shall provide a systematic mechanism for determining whether the mitigation, enhancement and management measures contained in the Environmental and Social Management and Monitoring Plan (ESMMP) are being effectively implemented. The monitoring programme shall cover the **construction, operation and decommissioning phases** of the project. It shall focus on the environmental and social receptors most likely to be affected by the project, particularly the existing forest ecosystem, tree and root systems, wildlife, soils, drainage and water resources, waste and wastewater, air quality, noise, lighting, fire risk, occupational health and safety, visitor safety, traffic, cultural values and community benefits.

9.1 Baseline Monitoring

Before commencement of physical construction, the Proponent shall establish a pre-construction environmental and social baseline against which subsequent monitoring results can be compared. The baseline shall be documented using photographs, maps, GPS/GIS information, inspection records, field sheets and laboratory results where sampling is undertaken.

Baseline Component	Baseline Information Required	Proposed Monitoring Location
Forest vegetation	Tree inventory, species, condition, canopy, regeneration	Project footprint and adjacent forest
Root protection	Location of major root zones and Tree Protection Zones	All development areas
Wildlife	Species/indications, activity and sensitive areas	Project site and surrounding forest
Soil	Soil condition, erosion susceptibility and disturbed areas	Construction footprint and drainage areas
Drainage	Existing drainage routes and runoff patterns	Site and downstream areas
Water	Existing water sources and relevant quality parameters	Project water sources/receptors
Air quality	Existing dust/particulate conditions where justified	Project boundary/sensitive receptors
Noise	Existing ambient noise	Project boundary and sensitive locations
Community	Existing forest use, access, livelihoods and concerns	Adjacent communities/forest users
Cultural resources	Identified cultural/spiritual areas	Site and zone of influence
Traffic	Existing access conditions	Main access route and site entrance

9.2 Construction-Phase Monitoring Plan

Construction monitoring shall commence **before site mobilization** and continue until the contractor has completed restoration and environmental handover.

Parameter / Aspect	Monitoring Indicator	Target / Performance Standard	Monitoring Method	Location	Frequency	Responsibility	Record / Report	Indicative Annual/Phase Cost (KSh)
Tree	Number of retained	**Zero**	Tree	Entire	Before	Environmental Officer,	Tree	300,000

protection	trees affected	**unauthorised tree cutting**; zero avoidable major root damage	inspection/GPS/photos	construction footprint	works; weekly; after major works	Ecologist, KFS	register	
Tree Protection Zones	Compliance with demarcated zones	100% protected areas maintained	Site inspection	Development areas	Daily during works	Contractor/Environmental Officer	Inspection checklist	150,000
Vegetation clearance	Area cleared	Clearance restricted to approved footprint	Measurement/GPS/inspection	Construction areas	Weekly	Contractor/Environmental Officer	Site records	100,000
Soil disturbance	Exposed/eroded areas	No uncontrolled erosion	Visual inspection/photos	Construction areas	Weekly and after heavy rainfall	Contractor/Environmental Officer	Erosion register	150,000
Drainage	Blocked/failed drainage structures	Drainage continuously functional	Inspection	Site drainage network	Weekly/after storms	Contractor/Civil Engineer	Drainage checklist	150,000
Sediment control	Sediment leaving site	No uncontrolled sediment discharge	Inspection	Down-gradient areas	Weekly	Environmental Officer	Inspection report	100,000
Construction wastewater	Discharge/overflow incidents	**Zero untreated discharge**	Inspection/records	Worker facilities	Weekly	Contractor	Sanitation register	100,000
Solid waste	Waste segregation/disposal	100% controlled disposal	Inspection/waste records	Work areas/service yard	Daily/weekly	Contractor	Waste register	150,000
Hazardous materials	Spill incidents	Zero uncontrolled spills	Inspection/incident records	Storage/service areas	Weekly	Contractor/Environmental Officer	Spill register	150,000
Dust	Visible dust/nuisance	No persistent uncontrolled dust	Visual inspection; instrument measurement where necessary	Site boundary	Daily during dusty works	Contractor	Dust log	100,000
Noise	Noise complaints/measurements	Compliance with applicable requirements	Observation/measurement where required	Work areas/boundary	Weekly and during noisy activities	Environmental Officer	Noise log	150,000

Wildlife	Wildlife incidents/disturbance	Zero deliberate harassment/injury	Observation/incident records	Forest interface/trails	Daily/weekly	Ecologist/KFS	Wildlife register	200,000
Fire	Fire incidents/readiness	Zero uncontrolled fires; functional fire equipment	Inspection/drills	Entire site	Weekly; quarterly drills	Safety Officer/KFS	Fire register	200,000
OHS	Injuries/PPE compliance	100% induction and PPE compliance	Safety inspection	Construction site	Daily/weekly	Safety Officer	OHS register	250,000
Traffic	Traffic incidents	No uncontrolled construction traffic	Observation/incident records	Access route	Daily	Contractor	Traffic log	100,000
Public safety	Unauthorised access incidents	Zero unauthorised entry into active works	Inspection	Site boundaries	Daily	Contractor/Security	Security log	100,000
Community grievances	Complaints received/resolved	All grievances recorded and addressed	Grievance register/interviews	Community interface	Monthly	Community Liaison Officer	Grievance report	100,000
Local employment	Percentage of local workers	Target **≥60% local positions where suitably qualified personnel are available**	HR records	Project	Monthly	CBO/Contractor	Employment report	50,000
Cultural resources	Chance finds/incidents	All chance finds protected/reported	Inspection/incident reporting	Project site	Continuous	Contractor/KFS	Chance-find register	50,000
Site restoration	Temporary areas restored	100% temporary work areas restored	Joint inspection/photos	Construction footprint	At completion	Contractor/KFS/Environmental Officer	Completion report	200,000

9.3 Operational Monitoring Plan

Operational monitoring shall be more continuous because the facility will remain within a forest ecosystem for the duration of its operational life.

Parameter / Aspect	**Indicator**	**Target / Performance Standard**	**Method**	**Location**	**Frequency**	**Responsibility**	**Record / Report**	**Indicative Annual Cost (KSh)**
Tree health	Tree mortality/damage/decline	No avoidable project-related tree damage	Arboricultural inspection	Entire facility/forest interface	Quarterly	Ecologist/KFS	Tree health report	300,000
Root zones	Compaction/disturbance	No new unauthorised disturbance	Inspection	Tree Protection Zones	Monthly	Facility Manager/KFS	Root-zone checklist	100,000
Wildlife	Wildlife sightings/incidents	No deliberate harassment; disturbance minimised	Observation/incident records	Trails/forest	Weekly/monthly	Ecologist/KFS	Biodiversity register	300,000
Visitor behaviour	Off-trail access/feeding/wildlife incidents	Zero deliberate wildlife harassment	Patrol/CCTV/records	Dino trail/forest	Daily	Facility Manager/KFS	Visitor incident log	150,000
Visitor numbers	Daily visitor numbers	Within approved/design capacity	Ticketing/registration records	Entry point	Daily	Facility Manager	Visitor database	50,000
Trail/boardwalk condition	Defects/vegetation damage	All defects corrected promptly	Inspection	Trails/boardwalks	Weekly	Facility Manager	Maintenance log	200,000
Waste	Waste quantity/segregation	Zero uncontrolled disposal	Inspection/weighing/records	Facility/service areas	Daily/weekly	Waste Officer	Waste register	250,000
Wastewater	System performance/overflow	**Zero untreated discharge or overflow**	Inspection and testing where required	Eco-toilets/treatment system	Weekly/monthly	Facility Manager	Wastewater log	400,000
Water quality	Relevant physical/chemical parameters	Within applicable standards/approved conditions	Laboratory analysis where required	Water sources/receptors	Quarterly/incident-based	Environmental Expert	Laboratory report	300,000
Water consumption	m^3 consumed/visitor	Reduction through	Meter readings	Facility	Monthly	Facility Manager	Water-use report	50,000

		efficiency measures						
Stormwater	Erosion/blockage	No persistent erosion or flooding attributable to project	Inspection	Drainage areas	Monthly/after heavy rain	Maintenance Manager	Drainage log	150,000
Energy	kWh/visitor and solar contribution	Solar system functional; energy use tracked	Meter records	Facility	Monthly	Facility Manager	Energy report	50,000
Lighting	Light spill/upward lighting	Dark-sky controls maintained	Night inspection	Facility/forest edge	Monthly	Facility Manager/KFS	Lighting inspection	100,000
Noise	Noise levels/complaints	Compliance with applicable requirements	Sound measurements where warranted/complaints	Facility boundary	Quarterly/complaint-based	Environmental Expert	Noise report	200,000
Fire	Equipment condition/drills/incidents	100% fire systems functional; quarterly drills	Inspection/drills	Facility	Monthly/quarterly	Safety Officer/KFS	Fire register	250,000
OHS	Incidents/near misses/training	Zero fatality; 100% staff induction	Inspection/records	Facility	Monthly	Safety Officer	OHS report	200,000
Visitor safety	Accidents/defects	Zero unresolved critical hazards	Inspection/incident register	Facility/trails	Daily/weekly	Facility Manager	Visitor safety register	150,000
Traffic	Incidents/parking compliance	Controlled traffic and parking	Observation/records	Access/parking	Weekly	Security/Facility Manager	Traffic register	100,000
Community employment	Local employment percentage	≥60% target where applicable	HR records	Facility	Quarterly	CBO/Facility Manager	Employment report	50,000
CBO benefits	Payments/benefits delivered	100% of agreed commitments documented	Financial/document review	CBO/facility	Quarterly	CBO/Proponent	Benefit-sharing report	50,000
Local procurement	Local suppliers/value	Local participation tracked	Procurement records	Facility	Quarterly	Procurement Manager	Procurement report	50,000
Grievances	Number/type/resolution	All complaints logged and responded to	Grievance register/interviews	Community	Monthly/quarterly	Community Liaison Officer	Grievance report	100,000

Tree nursery	Seedling production/survival	Nursery operational; indigenous species prioritised	Nursery records/inspection	Nursery	Monthly	Nursery Manager	Nursery report	200,000
Forest rehabilitation	Area restored/survival rate	Minimum **15.26 acres** progressively rehabilitated	GPS/GIS/field surveys	Restoration areas	Quarterly	CBO/KFS/Ecologist	Restoration report	500,000
Environmental education	Programmes/participants	Regular conservation education	Programme records	Museum/trails	Quarterly	Facility Manager/KFS	Education report	100,000
Annual environmental audit	Audit completed	Annual audit undertaken and corrective actions tracked	Formal audit	Entire project	Annually	NEMA-registered Environmental Expert	EA report	350,000
ESMMP compliance	Mitigation actions completed	≥90% scheduled actions completed; all critical actions closed	Compliance audit	Entire facility	Quarterly	Environmental Officer	ESMMP scorecard	200,000

9.4 Decommissioning and Post-Decommissioning Monitoring

Monitoring shall not end when buildings are removed. Because the objective is to return the site to an ecologically stable condition, post-decommissioning monitoring shall continue until restoration objectives have been achieved.

Parameter	**Indicator**	**Target**	**Method**	**Frequency**	**Responsibility**	**Duration**
Demolition/site safety	Incidents/access violations	Zero major incidents	Safety inspection	Daily	Contractor/Safety Officer	Decommissioning
Tree/root protection	Tree damage	Zero avoidable damage	Tree inspection	Daily	Ecologist/KFS	Removal works
Waste	Reuse/recycling/disposal records	100% controlled waste	Waste records	Weekly	Contractor	Decommissioning
Hazardous materials	Uncontrolled spills	Zero spills	Inspection	Daily	Contractor	Decommissioning
Soil erosion	Erosion features	No persistent erosion	Field inspection	Weekly/after rainfall	Environmental Officer	12 months
Drainage	Drainage restoration	Natural/approved drainage restored	Inspection	Monthly	Civil Engineer/KFS	12 months
Vegetation	Vegetation establishment	Restoration targets	Vegetation survey	Quarterly	Ecologist/CBO/KFS	1–3 years

restoration		achieved				
Wildlife recovery	Wildlife activity/disturbance	Evidence of ecological recovery	Biodiversity surveys	Quarterly	Ecologist/KFS	1–3 years
Restoration survival	Indigenous seedling survival	Agreed restoration survival target	Sample plots/GPS	Quarterly	CBO/Ecologist	1–3 years
Community concerns	Complaints	All residual grievances addressed	Interviews/register	Quarterly	CBO/KFS	1 year
Final restoration	Site condition	Site equal to or better than agreed baseline	Joint inspection	At completion and final review	Proponent/KFS/NEMA as applicable	End of restoration period

9.5 Overall Monitoring Commitment

The Murunya Camp monitoring programme shall therefore operate as a continuous management system rather than a once-off compliance exercise**.** The central principle shall be:

Monitor → Compare → Identify → Correct → Verify → Report → Improve.

The monitoring programme shall give particular priority to **forest integrity, tree/root protection, biodiversity, water and wastewater, waste, fire, visitor management and community benefits**, while maintaining routine monitoring of physical, biological and social conditions. The programme is also consistent with the EIA/EA regulatory framework, under which environmental monitoring is intended to determine actual and potential effects of project activities, while environmental auditing evaluates whether the project conforms with its approved environmental management plan.

CHAPTER TEN

10 CONCLUSION AND RECOMMENDATIONS

10.1 Conclusion

This Environmental and Social Impact Assessment (ESIA) Study Report has identified, assessed and evaluated the potential environmental and social impacts associated with the **Proposed Low-Impact Ecotourism Facility at Murunya Camp Site, Oloolua Forest, Kajiado County**, and has established appropriate measures for avoiding, minimizing, managing and monitoring the anticipated adverse impacts throughout the project life cycle. The assessment has established that the proposed development represents a **low-impact, forest-sensitive ecotourism investment** whose principal objective is to provide environmentally responsible recreation, tourism, education and hospitality facilities while maintaining the ecological character and conservation value of Oloolua Forest. The project has been conceived around the principle of working within the existing forest environment rather than replacing it**,** with emphasis on retention of existing trees, utilization of existing open/disturbed areas, elevated and lightweight structures, controlled visitor circulation and environmentally sensitive infrastructure.

The proposed project is expected to generate a range of positive environmental, social and economic benefits. These include creation of employment and income-generating opportunities, particularly for members of the surrounding community; development of local tourism and hospitality enterprises; opportunities for local suppliers and service providers; enhancement of environmental and conservation education; improved recreational and visitor facilities; support for forest conservation; establishment and operation of an indigenous tree nursery; forest restoration and rehabilitation; skills development; and enhancement of community participation in sustainable tourism and forest stewardship. The project is particularly expected to contribute to conservation through the proposed indigenous tree nursery and forest rehabilitation programme, including the commitment to progressively rehabilitate a minimum of **15.26 acres of forest**. The project also provides for community participation and local economic opportunities, including the target of reserving at least 60% of employment positions for suitably qualified local community members where applicable. These commitments should be treated as measurable project performance obligations and incorporated into the operational monitoring programme.

Notwithstanding these benefits, the ESIA has established that implementation and operation of the project may result in a number of adverse environmental and social impacts if appropriate controls are not applied. The principal potential impacts include disturbance to existing forest vegetation and tree root systems, wildlife disturbance, soil disturbance and erosion, alteration of surface-water drainage, water demand, wastewater generation, solid waste generation, dust and exhaust emissions, construction noise and vibration, light pollution, fire risk, occupational health and safety hazards, visitor safety risks, construction and operational traffic, disturbance of cultural or spiritual values, and potential community concerns relating to access, employment and benefit sharing. However, the assessment has established that *the majority of the anticipated adverse impacts can be effectively avoided, minimized or controlled through proper project design, implementation of the ESMMP and continuous environmental and social monitoring*.

On the basis of the findings of this ESIA, no adverse environmental or social impact has been identified that is considered incapable of being appropriately managed, provided that the recommended mitigation measures, monitoring programme and management commitments are fully implemented**.** The proposed Murunya Camp ecotourism facility is therefore considered environmentally and socially feasible subject to strict implementation of the recommendations and conditions contained in this ESIA Report and any conditions subsequently imposed by NEMA, Kenya Forest Service and other relevant regulatory authorities.

10.2 Recommendations

Based on the findings of the ESIA, the following recommendations are made for implementation by the Proponent and other responsible parties.

1. **Compliance with Environmental Approval Requirements**: The Proponent shall obtain and

comply with all applicable environmental approvals, permits, licenses and conditions before commencing activities requiring such approvals. Physical construction shall not commence before the required NEMA environmental approval/EIA license has been obtained, together with the applicable Kenya Forest Service and other statutory approvals.

2. **Strict Implementation of the ESMMP**: The Environmental and Social Management and Monitoring Plan contained in this ESIA shall form an integral part of project implementation. The ESMMP shall apply during construction, operation and decommissioning.

3. **Protection of Existing Forest and Trees:** The Proponent shall maintain the project's commitment to zero unauthorized tree cutting. Before construction, a detailed tree and ecological survey shall be undertaken to identify trees requiring protection and establish appropriate Tree Protection Zones and root-protection measures.

4. **Environmentally Sensitive Construction**: Construction shall adopt low-impact techniques consistent with the project's ecotourism character. Where technically and ecologically appropriate, elevated/lightweight structures and low-disturbance foundation systems shall be used to minimize excavation, soil disturbance and damage to tree roots.

5. **Wildlife and Biodiversity Protection**: Wildlife protection measures shall be implemented throughout construction and operation. Workers, contractors and visitors shall be prohibited from hunting, trapping, feeding, capturing or deliberately harassing wildlife. Visitor movement shall be restricted to designated trails, boardwalks and approved activity areas. Lighting, noise and visitor activities shall be managed to minimize disturbance to nocturnal and other sensitive species.

6. **Forest Rehabilitation and Indigenous Tree Nursery**: The Proponent shall implement the proposed indigenous tree nursery and forest rehabilitation programme as a core environmental enhancement measure rather than treating it as an optional community initiative.

7. **Water and Wastewater Management**: Water shall be used efficiently throughout the project. All wastewater shall be managed through an appropriately designed and approved sanitation/wastewater management system. Wastewater systems shall be regularly inspected, maintained and serviced, with appropriate records retained.

8. **Solid Waste Management**: The Proponent shall implement waste minimization, segregation, reuse, recovery, recycling and responsible disposal throughout the project.

9. **Fire Prevention and Emergency Preparedness**: Given the location of the project within a forest environment, fire management shall be treated as a high-priority operational requirement.

10. Undertaking of environmental audits and submission of reports as required; and

11. Compliance with all conditions imposed by NEMA, KFS, the County Government of Kajiado and other competent authorities.

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