

Impact of Human Activities on Conservation of Lake Kamnarok Game Reserve, Baringo County, Kenya

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ABSTRACT

This study investigates the impact of human activities on the conservation status of Lake Kamnarok Game Reserve in Baringo County, Kenya. The main objectives were to identify the major human activities affecting the lake's ecosystem and evaluate the effectiveness of mitigation strategies. A cross-sectional research design was employed, and a sample of 323 respondents was selected using both stratified random sampling for community members and purposive sampling for key informants. Data were collected through structured interviews, questionnaires, direct field observation, and photography. Analysis was conducted using SPSS, applying both descriptive and inferential statistics. Findings were presented in tables and figures.

Results revealed that overgrazing (92.5%), agricultural expansion (38.2%), and deforestation (18.0%) were the key drivers of habitat degradation, biodiversity loss, and increasing human-wildlife conflict. Statistical analysis showed a significant difference in the impacts reported ($\chi^2 = 288.5$, $df = 6$, $p < 0.0001$). While various mitigation strategies have been implemented—such as awareness campaigns, enforcement of conservation laws, and eco-tourism promotion—their effectiveness remains limited due to weak enforcement and minimal community participation. The study concludes with recommendations for strengthening policy enforcement, community engagement, and adoption of integrated conservation approaches to enhance the sustainability of Lake Kamnarok Game Reserve.

Keywords: Lake Kamnarok, human activities, conservation, overgrazing, biodiversity, community participation, Kenya.

INTRODUCTION

Lake Kamnarok Game Reserve is located in Baringo County, Kenya, and is part of the greater Kerio Valley ecosystem. It was gazetted as a reserve in 1983 and has a rich diversity of wildlife, including elephants, crocodiles, and bird species. Aside from its ecological value, the lake provides water for domestic use, agricultural activities and livestock for the surrounding communities. However, in the recent past, the reserve has been facing increased threats from human encroachment, overgrazing, unsustainable farming, and illegal logging.

The main objective of this study was to assess the extent to which human activities have influenced conservation of Lake Kamnarok game reserve. It also investigated the existing mitigation measures and evaluates their effectiveness in ensuring there is sustainable management of the ecosystem. The significance of this study lies in its potential to inform policymakers and conservation practitioners about the urgent need for collaborative actions and sustainable land-use practices around Lake Kamnarok game reserve.

Study Area

Lake Kamnarok Game Reserve is located in Kerio Valley between Tugen Hills and the escarpment of Elgeyo. It forms part of Baringo County experiencing semi-arid climate, with erratic rainfall patterns and prolonged droughts. The lake is seasonal with siltation being the most common challenge especially during rainy seasons. There has been a drastic reduction in water levels and wildlife populations over the past two decades. The

primary economic activities of the locals include livestock keeping, subsistence farming, and charcoal production, which directly impact the health status of the ecosystem.

METHODOLOGY

A cross-sectional research design was used to gather both qualitative and quantitative data. The study employed stratified and purposive sampling techniques to select 323 respondents, including local residents, Kenya Wildlife Service officers, county officials, and other stakeholders.

Data collection methods included: - Structured questionnaires administered to residents - Interviews with key informants - Field observations - Use of photographic evidence

Descriptive statistics were used to analyze quantitative data, while inferential statistics such as Chi-square were used to determine the significance of relationships. Data were analyzed using SPSS and presented in tables and figures. The reliability and validity of instruments were checked through a pilot study conducted in nearby villages with similar ecological settings.

RESULTS AND DISCUSSION

Human Activities Affecting the Ecosystem

The study identified three dominant human activities impacting conservation: - Overgrazing (92.5%): Resulting in vegetation loss, soil erosion, and trampling of habitats. - Agricultural expansion (38.2%): Encroachment into the buffer zones and wetland areas. - Deforestation (18.0%): Illegal logging for charcoal and construction.

Ecological Consequences

These activities have led to: - Habitat fragmentation - Loss of wildlife species - Increased cases of human-wildlife conflict - Siltation and shrinking of the lake

Effectiveness of Mitigation Measure

The main strategies identified include: - Awareness campaigns - Enforcement of laws by Kenya Wildlife Service - Promotion of eco-tourism - Establishment of protected zones While these interventions are valuable, implementation is hindered by inadequate staffing, funding constraints, and lack of community involvement. Informants noted that without sustainable livelihoods, local people continue to exploit resources illegally.

Stakeholder Perspectives

Local community members expressed willingness to engage in conservation but requested more support through education, alternative livelihoods, and inclusion in decision-making. Conservation officers emphasized the need for stronger enforcement and political goodwill. Community elders and youth leaders suggested partnerships with NGOs and conservation organizations to enhance capacity-building initiatives.

CONCLUSION AND RECOMMENDATIONS

The study concludes that Lake Kamnarok Game Reserve is under significant pressure from human activities, especially overgrazing, agricultural encroachment, and deforestation. Although mitigation measures exist, they require stronger enforcement and greater community involvement.

Recommendations

- Increase funding and capacity for conservation enforcement.
- Promote environmental education and awareness.
- Integrate local communities into conservation planning.
- Promote sustainable agricultural activities and alternative sources of income for the local communities.

- Promote research and continuous monitoring of biodiversity trends.
- Enhance collaboration between government agencies, NGOs, and community-based organizations.

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