UNIVERSITY OF NAIROBI

LEGAL CHALLENGES OF INFRASTRUCTURAL DEVELOPMENTS ON GREEN SPACES IN KENYA: CASE OF THE NAIROBI EXPRESSWAY

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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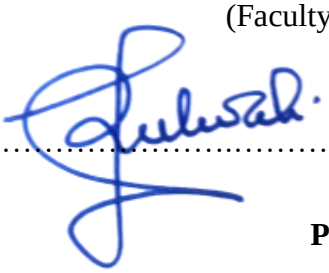

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DEDICATION

This thesis is dedicated to my family and friends. May this thesis serve as my sincere thanks for your sacrifices and support towards my study. Special dedication to my mentor Joyce Macharia and Joseph Mbochi for your unwavering support and inspiration, and to my line manager Margaret Njue for guidance and allowing me to dedicate time to focus on my studies.

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ABBREVIATIONS AND ACRONYMS

AFDB African Development Bank

BETA Bottom-UP Economic Transformation Agenda

CRBC China Road and Bridge Construction Corporation

EIA Environmental Impact Assessment

ES Ecosystem Services

ESIA Environmental and Social Impact Assessment

ESMMP Environmental and Social Management and Monitoring Plan

EMCA Environmental Management and Coordination Act

EU European Union

FAO Food and Agriculture Organization

GDP Gross domestic product

GS Green spaces

KANU Kenya Africa National Union

KeNHA Kenya National Highways Authority

KRB Kenya Roads Board

KURA Kenya Urban Roads Authority

MSME Micro and Small, Medium Enterprises

NCCAP National Climate Change Action Plan

NEMA National Environmental Management Authority

NGO Non-governmental organizations

SDG Sustainable Development Goal

SES Social Ecological Systems

SGR Standard Gauge Railway

SSA Sub-Saharan Africa

UES Urban Ecosystem Services

UGS Urban Green Spaces

UNEP United Nations Environment Programme

UNFCCC United Nations Framework Convention on Climate Change

ABSTRACT

This study was based on the recognition of the significant challenges posed by the growing number, size, and rate of urbanization and the consequences of infrastructural developments on open green spaces within urban cities. The overall objective of the study was therefore to determine the impact of infrastructural developments on green spaces in Nairobi city. This was examined by singling out the recently constructed Nairobi expressway as the focus of the study. The specific objectives of the study were to: determine stakeholder perceptions on the impacts of infrastructure developments on green spaces; to appraise the extent of the existing legal and institutional framework in safeguarding urban green spaces; and to determine the options for securing green spaces in the face of infrastructure development. Based on the social ecological systems theory which explains the need for key stakeholders in an ecosystem, and how their interactions and cooperation devote to ecosystem conservation, the study sampled views from a total of 92 visitors and traders who utilize Uhuru park for business and recreation purposes and ten key informants from the National Management Environmental Authority, The Nairobi County government, the Green Belt movement, The Kenya National Highways Authority and an Environmental lawyer on their views regarding the impact of the Nairobi express way construction on green spaces. Additionally, a critical analysis on existing literature on conservation of green space and key legislative frameworks on environmental conservation was done. From the study it was established that, the operational phase of the Nairobi expressway has had an impact on Uhuru Park. Significant observable impacts included destruction of vegetation and tree cover along the marked areas and an increase threat of physical encroachment to the green spaces. Additionally, findings showed that there exist legal and institutional frameworks that serve to protect the environment but lack particularity as they are spread out over many legislations. These laws are spread over numerous pieces of legislation but are hardly followed nor applied to secure green spaces. Finally, it was established that there is limited public stakeholder knowledge on existing legal frameworks on environmental conservation and limited public participation on environmental conservation matters. The study hence recommends more amendments to existing legal and institutional frameworks and the gazettement of green spaces to protect them from future threats. Other recommendations include more public education on importance of environmental activism on conservation and increased funding toward environmental conservation.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

It is projected that by 2050, cities will be home to 6.68 billion people, or 68% of the global population, contrasted to the present-day population of 4.2 billion, comprising 55% of the total population.[1] Globally, cities are characterized by an elevated level of human population concentration and host an amalgam of economic, cultural, academic, and social activities.[2] Recent years have seen a persistent rise in urban development, an advance that is likely to endure, with cities predicted to host most the world's population growth soon. Municipalities across the world stand at differing stages of development and the speed of urbanization and rise in population pose an array of difficulties concerning public health and the environment, as well as concerns regarding sustainability.[3]

Multiple cities, particularly in the developing world, are encountering difficulty in keeping up with their advancing populace sizes and migratory movements.[4] Rapid cities enlargement both in size and population thickness is apparent in numerous underdeveloped countries. Rapid urban expansion is particularly acute in the global South, induced by the sudden rise in demographic alterations. Sub-Saharan Africa (SSA), for example, has been confronted with considerable shifts in population size over the last several decades, a phenomenon likely to continue.[5] This ever-growing urban population continues to demand more public services, housing, and infrastructure, thus exerting more pressure on the urban environment.[6] Significant challenges are posed by the growing number, size, and rate of urbanization, as well as the

1 United Nations, Department of Economic and Social Affairs, and Population Division, World Population Prospects Highlights, 2019 Revision Highlights, 2019 Revision (2019).

2 'When Urban Green Spaces Meet Infrastructure Development in Kenya: A Case of the Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' <https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=22&id=&page=> accessed 22 September 2023.

3 ibid.

4 ibid.

5 ibid.

6 Marié J du Toit and others, 'Urban Green Infrastructure and Ecosystem Services in Sub-Saharan Africa' (2018) 180 Landscape and Urban Planning 249 <https://www.sciencedirect.com/science/article/pii/S0169204618304419> accessed 29 November 2023.

continuous transformation of virgin land at various spatial scales, leading to a decline in biodiversity and a change in ecosystem functionality.[7]

Urban growth often coincides with the development of transportation systems linking cities to one another.[8] There is a clear correlation between the quantity and quality of transportation infrastructure within a region and its level of economic progress. Areas with high-density infrastructure and easily interlinked transit systems tend to register elevated degrees of growth.[9] The transport sector is essential to economic prosperity and serves as a pivotal mechanism for growth. This is especially evident within the ambit of the present-day globalized economy, where economic assurance is closely intertwined with the cross-border movement of people, merchandise, in addition to info-communications technology. Efficient transportation networks bestow both economic and societal advantages, resulting in engendered multiplying effects.[10] The global economy's expansion and development are dependent on the availability of adequate transportation infrastructure, including that of sub-Saharan Africa's (SSA) developing nations.[11] Transport infrastructure, such as road, airports, bridges, railway lines, marine ports, and seaports, among others, has shown to be essential for economic expansion through the ease of moving people, goods, and services.[12]

Despite the numerous advantages, there is a growing recognition of the impacts that infrastructure development has on the natural environment particularly on green spaces in urban cities.[13]These infrastructures can have detrimental ecological impacts both directly (their presence), and indirectly (human activities facilitated by the infrastructure).[14] The effects range

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7 Thomas Elmqvist and others (eds), Urbanization, Biodiversity and Ecosystem Services: Challenges and Opportunities (Springer Netherlands 2013) <http://link.springer.com/10.1007/978-94-007-7088-1> accessed 27 March 2021.

8 'When Urban Green Spaces Meet Infrastructure Development in Kenya: A Case of the Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 2).

9 Jean-Paul Rodrigue, Claude Comtois and Brian Slack, *The Geography of Transport Systems* (Third edition, Routledge 2013).

10 ibid.

11 The Africa. Development Bank. African Economic Outlook, (2018). Available at: http://afdb.org

12 The African Union. Programme for infrastructure development in Africa: addressing the infrastructure gap in Africa, to speed up regional integration. (2014). 14–18

13 Tobias Ochieng Nyumba and others, 'Assessing the Ecological Impacts of Transportation Infrastructure Development: A Reconnaissance Study of the Standard Gauge Railway in Kenya' (2021) 16 PLoS ONE e0246248 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7845991/> accessed 22 September 2023.

14 ibid.

from destruction and loss of ecosystems and natural habitats, greenhouse gas emissions, climate change [15] , noise pollution from vehicle operations, soil pollution, water pollution, air pollution, [16] environmental degradation, fragmentation of habitats, population and genetic isolation, and the loss of green spaces.[17] These negative repercussions accompanied by the physical footprint of the infrastructure, especially roads, amplifies the struggle between economic development, social progression, and environmental pressures. [18] Consequently, there is a heightened requirement to ascertain, evaluate, and lessen the effects of roads and other forms of transit infrastructure. Engagement of stakeholders in infrastructure construction could assist in emphasizing these repercussions and providing the evaluation of options during planning, design, implementation, and mitigation of the associated impacts associated with the development.[19]Thus, although transport infrastructure such as roads are essential to economic prosperity and serves as a pivotal mechanism for growth, [20] this shouldn't be done at the expense of green spaces.

Urban green spaces (UGS) provide a variety of benefits that endure and progress standards of living and improve quality of life through ecosystem services (ES). [21] UGS are vegetation-covered spaces, which encourage leisure activities and improve the urban environment.[22] These spaces include parks, roadside trees, and residential gardens,[23] which are an inseparable component of the urban ecosystem,[24] as they are considered a natural-based solution to solve

15 'When Urban Green Spaces Meet Infrastructure Development in Kenya: A Case of the Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 2).

16 Rodrigue, Comtois and Slack (n 9).

17 Carleigh Ghent, 'Mitigating the Effects of Transport Infrastructure Development on Ecosystems' 11.

18 Rodrigue, Comtois and Slack (n 9).

19 Nyumba and others (n 13).

20 Rodrigue, Comtois and Slack (n 9).

21 Oxana Klimanova, Eugeny Kolbowsky and Olga Illarionova, 'Impacts of Urbanization on Green Infrastructure Ecosystem Services: The Case Study of Post-Soviet Moscow' [2018] Belgeo <http://journals.openedition.org/belgeo/30889> accessed 27 March 2021.

22 José G Vargas-Hernández, Karina Pallagst and Justyna Zdunek-Wielgołaska, 'Urban Green Spaces as a Component of an Ecosystem' in Joan Marques (ed), Handbook of Engaged Sustainability (Springer International Publishing 2018) <http://link.springer.com/10.1007/978-3-319-53121-2_49-1> accessed 7 May 2021.

23 Martina Artmann, Olaf Bastian and Karsten Grunewald, 'Using the Concepts of Green Infrastructure and Ecosystem Services to Specify Leitbilder for Compact and Green Cities—The Example of the Landscape Plan of Dresden (Germany)' (2017) 9 Sustainability 198 <http://www.mdpi.com/2071-1050/9/2/198> accessed 10 May 2021.

24 Peihao Song and others, 'Assessing the Ecosystem Services of Various Types of Urban Green Spaces Based on I-Tree Eco' (2020) 12 Sustainability 1630 <https://www.mdpi.com/2071-1050/12/4/1630> accessed 10 May 2021.

the existing environmental problems in the city.[25] They are essential in maintaining the sustainability of the urban ecosystem by offering an abundance of ecosystem services, and have economic and social benefits that ensure human wellbeing. These spaces are vital and key assets in the proper functioning of the city as they influence a city's economy, environment, health and safety, integration, and connectivity; as a result, they have a significant impact on how a city performs politically and socially.[26]

The welfare of city residents is still dependent on urban green spaces,[27]as cities lacking them are neither attractive nor healthy for living. By fashioning, protecting, and developing UGS we can help reduce ecological footprints while improving health and quality of life and boosting resilience.[28] Evaluating and quantifying the benefits and services provided by UGS remains a contentious subject as evaluations done are barely implemented in urban planning,[29] although their contributions to citizens' wellbeing are increasingly acknowledged.[30] Goal 11 of the SDGs emphasizes the significance of UGS by focusing on creating inclusive, secure, robust, and cities that are sustainable and human settlements.[31] SDG 11 target 11.7 and 11.8 state that by 2030, everyone should have access to secure, inclusive green spaces, and that nations should work to improve overall development planning by advancing the objectives of countryside and municipal areas with regard to the environment, society and economy.[32]

Rapid urbanization has resulted in increased land use changes in urban areas, and infrastructure development is now more than ever on the rise to accommodate the increased population. This has resulted in encroaching UGS, affecting its supply of ES. The slow decline of UGS has been linked to the building of infrastructure and other changes to support the rising sum of

[25] Teresa Mexia and others 'Ecosystem Services_ Urban Parks under a Magnifying Glass | Elsevier Enhanced Reader' <https://reader.elsevier.com/reader/sd/pii/S0013935117316602?token=77AA4CDA06892A23B90CAF8C3ACD856DB605386F4F6DFD96785555199C866608A71F45BB5ED16501C49752E4FFE69B69&originRegion=eu-west-1&originCreation=20210510084004> accessed 10 May 2021.

[26]'National-Urban-Policies-Driving-Public-Space-Led-Urban-Development.Pdf' <https://unhabitat.org/sites/default/files/2020/07/national-urban-policies-driving-public-space-led-urban-development.pdf> accessed 10 May 2021.

[27] 'Ecosystem Services_ Urban Parks under a Magnifying Glass | Elsevier Enhanced Reader' (n 25).

[28] 'Urban ecosystem services' (*C/O City*) <https://www.cocity.se/om-oss/urban-ecosystem-services/> accessed 11 May 2021.

[29] Song and others (n 24).

[30] ibid.

[31] 'Goal 11 | Department of Economic and Social Affairs' <https://sdgs.un.org/goals/goal11> accessed 18 September 2022.

[32] ibid.

individuals residing in metropolises.[33] According to statistics, Africa's UGS are diminishing at an alarming rate, with green spaces comprising a small portion of urban areas' landmass.[34] One of the main aspects that has ensured continued conservation and uphold of the ecosystem services is the regulatory framework. Most countries have swiftly adopted regulations that are aimed at ensuring sustainable infrastructural development, green spaces, and ecosystem services protection. [35] Ghent Carleigh considers transport infrastructural development projects to be the most disastrous in affecting the ecological ecosystems, thus proposes the need for regulations to cover the road construction projects and how they can be controlled to conserve the ecosystems.[36] In SSA, nations have established clear legal guidelines for the construction of transportation infrastructure, including the need to complete Environmental Impact Assessments (EIA) prior to, during, and following project implementation. In South Africa for instance, the legal framework provides that transport infrastructure such as roads ought to be assessed to establish their environmental impact to ensure that they do not have long-term adverse implications on the environment.[37] EIA is a requirement for road constructions under South African law because ecological management is a crucial component of infrastructure development. The EIA makes specific suggestions like planting vegetation and using wire mesh on roadside to stabilize the ecosystem by reducing soil erosion, landslides, and controlled sedimentation into streams. Effective environmental management and ecosystem protection are promoted by integrated approaches.[38]

In Kenya, transport infrastructures are fundamental to the country's economic growth and development. To ensure seamless implementation of such infrastructure, therefore, there are key regulatory frameworks which provide guidelines to both the contractors and the government on how the processes will be effectively run. EIAs are required for all infrastructure development projects in Kenya that could negatively impact on the environment,

[33] Lindelwa Sinxadi and Maléne Campbell: Factors Influencing Urban Open Space Encroachment: The Case of Bloemfontein, South Africa' in Rob Roggema and Anouk Roggema(2020) .
[34] 'Africa, Urban, Green Spaces, Nature, Challenges' 12.

[35] Ghent (n 17).

[36] ibid.

[37] Karani, P. (2010). Environmental implications of the road network in South Africa. Development Bank of Southern Africa (DBSA)

[38] Environment Protection Authority – EPA. (2021). Construction environmental management plan (CEMP). Retrieved from http://www.epa.sa.gov.au/files/12330_guide_cemp.pdf.

including projects involving transportation infrastructure.[39] According to the severity of their effects, the law categorizes these projects into three categories that is high, medium, and negligible risk. The Environmental Management and Coordination Act (EMCA) of 1999,[40] necessitates that a project proponent conducts an environmental impact assessment (EIA) and apply for an EIA license prior to commencing any project works as specified in the second schedule and submit a report.[41]Kenya National Highways Authority (KENHA) conducted (ESIA) an Environmental and Social Impact Assessment in accordance with the mandate to determine risks and impacts on the environmental and social perspective, posed by the Nairobi Expressway. The environmental impacts identified included noise pollution from excavation work and vibrations, air pollution from truck emissions and dust, and tree destruction along the highway. These impacts, however, were to be short-term, since upon completion of the project they would seize. Natural Justice, an environmental justice organization, indicated in a written response to the stakeholders that the ESIA for the Nairobi Expressway lacked (ESMMP) an Environmental and Social Management and Monitoring Plan, additionally, and did not present well-formulated Strategic Environmental Assessments (SEA).[42]

Often, little attention has been placed on how environmental regulations work in practice and measures to be taken to strengthen them, especially in middle- and low-income countries where they are considered secondary to economic growth, yet poor implementation of environmental regulation can have damaging consequences, especially for the natural resource base.[43]Most countries in Africa rely on multilateral donor organizations to fund their infrastructural development. These organizations have often prioritized infrastructural development over environmental concerns. A case in point is the African Development Bank (AFDB)[44],whose guidelines on environmental and social impact assessments (ESIA) provide an environmental framework that is used in selecting funded projects in countries that do not have a robust

[39] Transparency International Kenya. (2020). Environmental Impact Assessment Process in Kenya. Simplified Handbook.

[40]'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/EnvironmentalManagementandCo-ordinationAct_No8of1999.pdf> accessed 18 September 2023.

[41] Ibid

[42] Natural Justice – NJ. (2020). Written Submissions on The Environmental and Social Impact Assessment (Esia) Study Report for The Proposed Nairobi Expressway Project.

[43] Benjamin Barczewski: How Well do Environmental Regulations Work in Kenya? A Case study of the Thika Superhighway Improvement Project (2023)

[44] Ibid

environmental framework. A study by Barczewski notes that despite these regulations by the bank being a key framework for protecting ecosystems, the requirements have been ignored by countries, creating a loophole in which environmental concerns have not been addressed. [45]

Even though there exist legal and regulatory frameworks that serve to protect natural ecosystems, questions continue to be raised over the robustness of these frameworks and their effectiveness in protecting natural ecosystems in the wake of major industrial developments. According to Barczewski[46], in an examination of the effectiveness of the environmental regulations in Kenya through a case study of the Thika Superhighway Improvement Project, he reports that Kenya has an existing legal framework that protects environmental concerns during major infrastructural developments. Citing the Environmental Management and Coordination Act of 1999[47] (EMCA 1999), which lays out EIA guidelines to be used in assessing the impacts of development on the environment, he states that some of these guidelines lack particularities (the 'how' and 'what') to be done which are not clearly outlined before commencing a project that cause difficulties in implementation as the stakeholders involved would not clearly understand the environmental impacts that accompany such a project. A review by colins Odote on Kenya legal framework indicates that Kenya's regulations a acknowledges and includes provisions for green spaces, however these provisions are scattered among numerous statutes such as regulations related to land, environment, planning, forestry, and wildlife, rendering them less effective.[48] This means that green spaces such as Uhuru Park in Nairobi lack sufficient management and protection, making it susceptible to grabbing. The County Government of Nairobi needs to allocate resources for its management and make the provision for green spaces compulsory for maintenance.[49]

Kenya's Vision 2030 intentions are to metamorphosize Kenya into a middle-income technologically advanced country. by building roads, railways, ports, and airports. [50]This is also one of the major instrumental drivers of the Bottom-Up Economic Transformation

[45] Ibid

[46] Ibid

[47] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' (n 40).

[48] Collins Odote, 'Protecting Uhuru Park as a Public Open Space: Options and Implications' (2019) 2019 East African Law Journal 23 <https://heinonline.org/HOL/Page?handle=hein.journals/easfrilaj2019&id=264&div=&collection=>.

[49] ibid.

[50]. Kenya Vision 2030: Sector Progress Project 2018.

(BETA) agenda, which focuses on Agriculture; transforming micro, small and medium enterprise (MSME); Housing and Settlement; Healthcare; digital superhighway & creative economy; infrastructure; environment and climate change; education; gender; governance; security services and people with disabilities.[51]The Vision 2030 upholds that appropriately developed infrastructure gives Kenya a competitive edge in expansion and development of the economy. However, the government faces three major challenges,[52] building infrastructure necessitates a significant initial investment, a lengthy repayment period, widespread land use, and innovative technology, as well as a long planning and implementation period. Second, Infrastructure development is required for new development opportunities. Third, the way facilities and infrastructure services are run needs to be changed to keep up with global competition and meet the country's needs.[53]

Recently, green spaces such as Uhuru Park and the Nairobi national park have faced the constant risk of being converted to other land uses such as infrastructural development.[54] Even in the face of rapid urbanization over the years, Uhuru Park has remained a green space that has stood the test of time. In October 2019, the former President Uhuru Kenyatta launched the development of a 27-kilometer Nairobi expressway linking Jomo Kenyatta International Airport to James Gichuru Road.[55] This project was at first anticipated to be fiscally sponsored through a public-private venture and had been plotted by the National Environment Management Authority (NEMA) to be executed by the Kenya National Highway Authority (KeNHA) as far back as 2013.[56] The approximately 62 billion shillings development shillings was developed as a public-private cooperation with the China Road and Bridge Construction Corporation (Kenya) (CRBC) employing a build-operate-transfer model. [57] The Nairobi Expressway project faced criticism, due to the deficiency of public consultation and the plan to dissect the road through a portion of 23 meters Uhuru Park, which KeNHA has certified as

[51] 'Manifesto – Delivery.Go.Ke' <https://manifesto.delivery.go.ke/> accessed 13 September 2023.

[52] De-Graft Owusu-Manu and others: The Impact of Infrastructure Development on Economic Growth in Sub-Saharan Africa with Special Focus on Ghana' (2019).

[53] ibid.

[54] 'ibid .

[55] 'Nairobi Expressway Project · Natural Justice' (*Natural Justice*) <https://naturaljustice.org/eia-process/nairobi-expressway/> accessed 30 September 2023.

[56] Odote (n 48).

[57] 'Nairobi Expressway Project · Natural Justice' (n 55).

part of the road reserve for the Uhuru Highway. [58] Nonetheless, it went through various alterations, necessitating fresh feasibility studies and modifications in its design excluding the park from the undertaking. [59] Even with these guarantees, the Environmental and Social Impact Assessment Study (ESIA Study) still indicates that it will still have considerable repercussions on Uhuru Park and other ecologically sensitive areas in the vicinity of the Thika Interchange, Chiromo, Nyayo Stadium and the Railways Golf Club. [60] Hence reservations continue to hover around the juridical safeguarding of green spaces such as Uhuru Park and the practices considered when evaluating its transformation into alternative purposes,[61]and the accumulative effects of the project on green spaces within Nairobi.

1.2 Problem Statement

Transport infrastructure has been recognized as a catalyst for achieving economic growth;[62] however, they also pose negative effects on the environment.[63] This is no exception in Kenya where over the years land use has gone through various changes. With the growing demand for infrastructural development in Kenya, GS in urban areas have constantly faced the threat of being converted into other use, particularly for the development of the needed infrastructural projects.[64] This has seen Nairobi green spaces such as Uhuru Park, City Park and Uhuru Gardens often targeted for other land uses.[65] The concerns are even more prominent with the development of unsustainable transportation infrastructure that may result in land use changes that harm the environment. Noise, pollutant emissions, climate change, and the operation of vehicles and transportation infrastructure contribute to the loss of green spaces and therefore their ecosystem services.

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[58] Odote (n 48).

[59] ibid.

[60] 'Nairobi Expressway Project · Natural Justice' (n 55).– NJ. (2020). Written Submissions on The Environmental and Social Impact Assessment (Esia) Study Report for The Proposed Nairobi Expressway Project.

[61] Odote (n 48).

[62] 'Vision-2030-Popular-Version.Pdf'.

[63] Rodrigue, Comtois and Slack (n 9).

[64] 'A_Report_of_the_Land_Commission_of_Inquiry_into_the_Illegal_or_Irregular_Allocation_of_Land_2004.Pdf' <http://kenyalaw.org/kl/fileadmin/CommissionReports/A_Report_of_the_Land_Commission_of_Inquiry_into_the_Illegal_or_Irregular_Allocation_of_Land_2004.pdf> accessed 11 May 2021.

[65] Collins Odote, Protecting Uhuru Park as a Public Open Space: Options and Implications) 2019 East African Law Journal 23 <https://heinonline.org/HOL/Page?handle=hein.journals/easfrilaj2019&id=264&div=&collection=>.

Another major case of infrastructural development threat to UGS in Kenya is the recently commissioned Nairobi Expressway that has been done near Uhuru Park, The Nairobi Arboretum, and the Nairobi National Park. Having been completed in 2020 and launched closely thereafter, it is imperative to assess the current impacts the major infrastructure has had on the green spaces in its proximity. Over and above the physical encroachment, infrastructure development has effects on GS that are neither valued nor regulated by law. Existing strategies for protecting green spaces on the other hand are focused more on their encroachment than on the environmental benefits they provide. The recent threats on green spaces within Nairobi City also trigger questions regarding the extent to which the existing environmental regulations in Kenya protect the existing green spaces from extinction and physical encroachment that result from major infrastructural developments.

Based on the arguments by Kosgey and Mutinda[66] who noted that impacts on local ecosystems are cumulative and the EIA is limited in its application as a tool for achieving sustainable development as far as the Nairobi Expressway project is concerned, the aim of this study therefore was to analyze the impact of major infrastructural development (Post-Construction) on green spaces and their ability to provide ecosystem services in Nairobi in from a multiple stakeholder perspective with the focus on the study being on the Nairobi Expressway.

1.3 Research Questions

This study sought to investigate the legal challenges of transport infrastructure development on green spaces and their ecosystem services in Kenya with a focus on the Nairobi Expressway.

1. What are the stakeholders' perceptions on the impact of Nairobi expressway development on green spaces and their ecosystem services within Nairobi?
2. How has the existing legal and institutional framework safeguarded urban green spaces?
3. What are the options for securing green spaces in the face of infrastructure development?

[66] Kosgei, Linda., Mutete, Mutinda. 'EIA as a Tool for Balancing Economic, Social and Environmental Considerations in Infrastructure Development: The Case of Nairobi Expressway, [2019] East Africa Law Journal 82
<https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=23&id=&page=>

1.4 Research Objectives

The objective of this study was to investigate the legal challenges of transport infrastructure development on green spaces and their ecosystem services in Kenya with a focus on the Nairobi Expressway. The specific research objectives for the study were:

1. To examine stakeholder's perceptions on the impact Nairobi expressway development on green spaces and their ecosystem within Nairobi.
2. To appraise the extent of the existing legal and institutional framework in safeguarding urban green spaces.
3. To determine the options for securing green spaces in the face of infrastructure development.

1.5 Significance of the Study

This study will be useful to law and policymaking sections because it highlights the existing gaps in the legal framework for GS that authorities and organizations concerned with green spaces can use to assess the state of UGS and take the necessary steps to protect them from infrastructure development. The study findings highlight how transportation infrastructure influences how green spaces are used. As a result, various agencies will be able to assess the transportation infrastructure impacts of infrastructure projects at various stages, such as construction, use, and induced impacts from areas that are later transformed for related developments. Researchers will benefit from the study's findings. This will be used as literature for their future UGS studies. They may discover gaps in the body of knowledge that they intend to fill in the future.

1.6 Theoretical Framework

The study was anchored on the Social Ecological Systems (SES) theory. Put forth by Berkes[67] and extensively discussed in the work by Berkes and Folke,[68] the theory explains the need for key stakeholders in an ecosystem, as well as how the interactions and cooperation among these stakeholders devote to ecosystem conservation and sustainable use. According to Berkes and Folke, a societal and environmental system is the collection or a group of resources and social

[67] Berkes, F. (1989) Common Property Resources: Ecology and Community-Based Sustainable Development.

[68] Berkes, F., & Folke, C. (1998) Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience

factors, such as natural resources, cultural diversities, and socio-economic characteristics, whose ongoing interaction and integration complete the ecosystem. Like the approaches to sustainable development, the SES theory upholds the interrelationship among three key aspects of the ecosystem, which are the economic aspects, the social aspects, and the environmental aspects. The theory has extensively pointed out the role of humans in the ecosystem, indicating that while previous approaches to the ecosystem left out humans, they are the main fundamentals in nature. As illustrated by Redman while in support of the SES theory, with the continued development and increase in human economic activities, the role of humans in the ecosystem cannot be left out, since their activities are both directly and indirectly brining impact on the ecosystem.[69] As the population keeps growing and the demand for services that depend on natural resources goes up, the coexistence and need for a balanced ecosystem is equally critical.[70] The SES consider the ecosystem and the environment in general as a system, whose success (sustainable use) depends on the interrelationship between key stakeholders drawn from political, societal, environmental management, and other major policy-makers and the sustainability of the ecology. Even though infrastructure development is becoming more important, the SES theory focuses on fairness by making sure that decisions not only help with development but also protect the environment through the sustainable utilization of ecosystems.[71]

In the context of infrastructural development and the green spaces in urban centers, the SES theory points out to the need for concurrent existence of both the development projects for economic growth and also conservation of the green spaces, where the social systems and ecosystems are integrated for sustainable development.[72] According to the theory, economic growth and development should not completely divert attention away from the natural environment, this should be viewed holistically, as the ecosystem also includes humans. The

[69] Redman, C., Grove, M. and Kuby, L. (2004). Integrating Social Science into the Long-term Ecological Research Network: Social Dimensions of Ecological Change and Ecological Dimensions of Social Change.

[70] Berkes, F., Colding, J., and Folke, C. (2003) Navigating social–ecological systems: building resilience for complexity and change.

[71] Madrid-Lopez C. & Giampietro M. 2015 The Water Metabolism of Socio-Ecological Systems Reflections and a Conceptual Framework

[72] Winter, K, Lincoln, K., & Berkes, F. (2018). The Social-Ecological Keystone Concept: A Quantifiable Metaphor for Understanding the Structure, Function, and Resilience of a Biocultural System.

infrastructural development activities must be sustainable, in the sense that they ought to be effectively aligned to the conservation of the natural resources, including the green spaces[73].

In Kenya, owing to the need of safeguarding green spaces and natural resources from the infrastructural projects such as the Nairobi Expressway, the SES theory puts into light on the need for policies and regulations to incorporate humans in nature (ecosystem) and how they can conduct their economic activities sustainably without straining the ecosystem. The socio-ecological systems theory upholds the need for viability, equitability, and bear ability of the human development activities towards achieving sustainability.[74] The infrastructure development such as the Nairobi Expressway project should be designed while having full consideration of the role played by the green spaces. Provision of ecosystem services cannot be simply substituted to development of infrastructure, since this will negatively affect the same people who the development projects are aimed at helping.[75] The socio-ecological systems theory is seen as a key theory to inform the study on the best approach and need to integrate both infrastructure development and the green spaces for continued supply of ecosystem services in urban areas.

1.7 Conceptual-Framework

The framework depicted in Figure 1.1 outlines the relationship between infrastructural development and conservation of green spaces and their ecosystem services.

[73] Morse, Stephen. "Post-sustainable development." *Sustainable development* 16, no. 5 (2008): 341-352.

[74] Mensah, Collins Adjei. "Destruction of urban green spaces: A problem beyond urbanization in Kumasi city (Ghana)." *American Journal of Environmental Protection* 3, no. 1 (2014): 1-9.

[75] Munyati, C., and J. H. Drummond. "Loss of urban green spaces in Mafikeng, South Africa." *World Development Perspectives* 19 (2020): 100226.

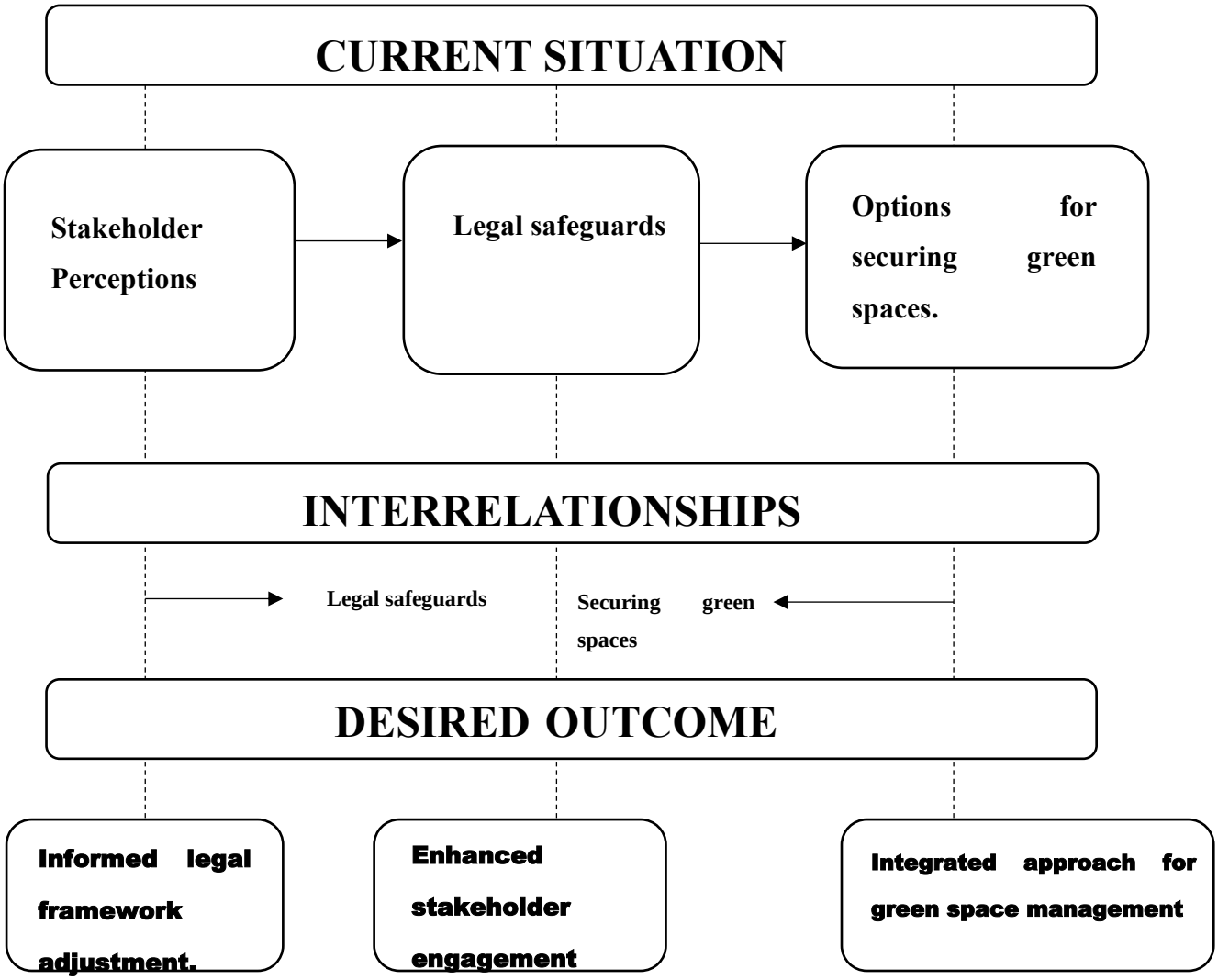

Figure 1.1: Conceptual Framework

Source: (Author)

The development of infrastructure such as the Nairobi expressway is necessary for ease of traffic and speeding up the economic growth and development.[76] As illustrated in the above conceptual framework, the current situation represents the status of green spaces. The interrelationships between stakeholder perceptions, legal safeguards, and methods of securing green spaces will lead to desired outcomes in conservation of green spaces which are represented through informed policy and law adjustments, enhanced stakeholder engagement and the generation of integrated approaches for green space management

[76] Mwangi, Mary Wambui. An Assessment to The Challenges Facing UGS a Case of City Park in Nairobi (2019).

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews thematic preceding literature regarding the research problem specifically focusing on the legal challenges of transport infrastructure development on green spaces in Kenya. Subsequently, best practice case studies have been reviewed to inform successfully managed the balance between infrastructure development and the preservation of green spaces. The chapter highlights the key gaps obtained from previous studies that the current study seeks to address.

2.2 Impact of Transport Infrastructure Development on Green Spaces

The development of transportation systems such as roads, is important for economic and social opportunities. Transport infrastructure is a vital capital for connecting regions and fostering economic, social, and cultural growth and interactions.[1] Societies are increasingly reliant on their transportation infrastructure to support a wide range of activities, such as commuting, obtaining energy needs, and moving parts between fabrication and distribution facilities. The development of transport systems has been an ongoing challenge to meet mobility needs, support economic growth, and participate in the global economy.[2] A. Hull, analysis of the cumulative impacts of transport projects,[3] reveals the need to strike a balance between the benefits of transport infrastructure to the economy and the enhancement of living standards, and the mounting evidence of how human behavior affects climate change. An empirical study by Aušrinė and Daiva indicates that the impacts of infrastructure development have always been assessed ©n terms of technical, financial, economic, and environmental elements as well as considerations related to road safety and land use.[4] From an environmental point of view, the focus is mainly placed on the components of a negative impact of transport: air pollution, noise, soil contamination, harm done to the protected natural areas, and to the landscape. It is

[1] Oksana Skorobogatova and Irina Kuzmina-Merlino, 'Transport Infrastructure Development Performance' (2017) 178 Procedia Engineering 319 <https://www.sciencedirect.com/science/article/pii/S1877705817300565> accessed 22 September 2023.

[2] 'Transport Infrastructure - an Overview | ScienceDirect Topics' <https://www.sciencedirect.com/topics/social-sciences/transport-infrastructure> accessed 23 September 2023.

[3] Angela Hull, 'Evaluating the Cumulative Effects of Transport Projects' in Angela Hull and others (eds), *Evaluation for Participation and Sustainability in Planning* (Routledge 2011).

[4] Aušrinė Griškevičiūtė-Gečienė and Daiva Griškevičienė, 'The Influence of Transport Infrastructure Development on Sustainable Living Environment in Lithuania' (2016) 134 Procedia Engineering 215 <https://www.sciencedirect.com/science/article/pii/S1877705816000655> accessed 25 September 2023.

relevant when talking about road transport because transport infrastructure usually divides an anthropogenic environment into separate "islets", isolating natural territories and encroaching into biodiversity. [5] The environmental impacts of transportation can range from air pollution, noise pollution, and heat pollution to long-term global warming effects from carbon dioxide emissions.[6]

Globally, development plans project the construction of 25 million kilometers of new paved roads by 2050, a quantity sufficient to encircle the Earth more than 600 times.[7] Approximately 90% of these new roads will be built in developing nations, particularly in regions rich in biodiversity and environmental significance. Many developing countries often secure funding from international lenders or negotiate access to their natural resources to expand their transportation infrastructure. The rapid and extensive expansion of large-scale road and highway projects necessitates a comprehensive evaluation of their potential consequences. Well-planned roads can bring significant economic and social benefits, but poorly executed projects can lead to problems like environmental pollution, and social and political conflicts.[8] Transport infrastructure development drawbacks are principally in majorly urbanizing regions where developing incomes are growing and lifestyles of city dwellers are changing, leading to escalating private vehicle ownership and air pollution levels. [9]Oftentimes, these developing cities and towns are without strategies to cope with the sudden influx of private cars, leading to substantial traffic jams, air pollution, reduced efficiency, costly transportation, and a decrease in the quality of life. [10] This growth has made the transportation sector to be widely recognised as the chief source of air pollution in many countries. [11] In the United States, transport activities provide for about 60% of carbon monoxide outflow. According to RN

[5] ibid.

[6] Hull (n 101).

[7] Mohammed Alamgir and others, 'Economic, Socio-Political and Environmental Risks of Road Development in the Tropics' (2017) 27 Current Biology R1130 <https://linkinghub.elsevier.com/retrieve/pii/S0960982217311077> accessed 22 September 2023.

[8] ibid.

[9] 'When Urban Green Spaces Meet Infrastructure Development in Kenya: A Case of the Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 2).

[10] ibid.

[11] RN Colvile and others, 'The Transport Sector as a Source of Air Pollution' (2001) 35 Atmospheric Environment 1537 <https://www.sciencedirect.com/science/article/pii/S1352231000005513> accessed 23 September 2023.

Colvile, the United Kingdom, 24% of PM2.5, 54% of carbon monoxide, and 32% of Nox come from this sector. The cities of Beijing and Guangzhou in China are home to motor vehicles that account for more than 80% of the carbon monoxide in the air. [12] In Kenya transportation is also undeniably a leading contributor to air pollution, the nation's transportation sector primarily consists of out-dated, inefficient, and unmaintained vehicles, which discharge a significant amount of toxins into the atmosphere.[13] This sector is accountable for around 25% of the nation's carbon dioxide discharges; the most prominent greenhouse gas that negatively impacts the climate. A United Nations Environment Programme (UNEP) report revealed that the transport sector in Nairobi accounts for a large chunk of the city's air pollution, at 60%. The survey exposed the high levels of air contaminants, particularly particulate matter, for many reasons, such as the abundant vehicles on the roads, swallowed-up road surfaces, and the lack of upkeep on vehicles. [14] These problems of overcrowding and contamination negatively influence a nation's gross domestic product (GDP) by leading to considerable health and efficiency losses. Therefore, it is pivotal to reorient the thought process in these cities to guarantee that fiscal growth doesn't bring about deteriorating results on the environment and society, as the complete result of road network expansion may conceivably be vacuous or detrimental when factoring in the entire benefits and losses.

In China, green spaces have declined over the years because of increased investment in infrastructural development, which in most cases targets the unoccupied areas, and areas where the ecosystems are[15]. While the environmental bodies and other institutions continue to push for conservation of the ecosystems and not intruding into them when developing infrastructure, the priority has always gone to the transport infrastructure. Environmentalists argue that the continued transport infrastructural development in urban areas with degradation of the ecosystem resources affects the sustainability of future generations and deprives the environment from the benefits of the ecosystem services.

In Canada, while infrastructural development in urban areas continues to be a critical focus, the green spaces have also been upheld, with very minimal disturbance of the ecosystem

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[12] ibid.

[13] 'Transport Sector Identified as Major Contributor to Air Pollution in Kenya' <https://www.fundsbeeline.com/news/readnews/Transport-Sector-Identified-as-Major-Contributor-to-Air-Pollution-in-Kenya> accessed 25 September 2023.

[14] ibid.

[15] Liu, On Yi, and Alessio Russo. "Assessing the contribution of UGS in green infrastructure strategy planning for urban ecosystem conditions and services." *Sustainable Cities and Society* 68 (2021): 102772.

services[16]. Canada continues to be one of the nations that has supported the conservation of green spaces in urban areas and integrated co-existence of the transport infrastructural development projects and the green spaces, given the development of infrastructure in the country and how extensive it has been over the past 20 years.[17] The primary causes of this coexistence is the continued focus on the designs of the projects and involving both the stakeholders in the environmental conservation and those in the transport infrastructural development projects. This ensures that they both give their opinions and provide the best framework for implementing the projects without degrading green spaces. [18]

The progress of infrastructural projects passes through three phases, each of which has an associated influence on the biosphere. At the outset, the design process involves proposing plans and devising techniques to accomplish the objectives without detrimentally impacting the environment. In Australia, the conservation of ecological systems during the initial stages of infrastructural improvement projects has invariably included the participation of specialists in such fields to accomplish sustainability while conducting the endeavors. Subsequently, the process of implementation proceeds with the fulfillment of the actual infrastructure projects while being cognizant of their effects on the green spaces.

In Morocco, over 40% of urban infrastructural development projects have put into consideration the green spaces by maximizing the conservation processes during the implementation stage[19]. The last stage is the assessment stage where the implemented projects are assessed to ensure they met the expected goals, particularly the conservation of the green spaces. This provides an opportunity for lesson-learning, where strategies are derived to conserve more green spaces in future projects.

The case has not been different in East Africa. Tanzania is one of East Africa's major commercial hubs with a long coastline and bordering eight countries, five of which are landlocked. The construction of new infrastructure such as roads is integral for promoting

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[16] Quinton, Jessica M., and Peter N. Duinker. "Beyond burial: researching and managing cemeteries as urban green spaces, with examples from Canada." *Environmental Reviews* 27, no. 2 (2019): 252-262

[17] Dupras, Jérôme, Charles Drouin, Pierre André, and Andrew Gonzalez. "Towards the establishment of a green infrastructure in the region of Montreal (Quebec, Canada)." *Planning Practice & Research* 30, no. 4 (2015): 355-375

[18] World Health Organization. "Urban green spaces: a brief for action." (2017).

[19] El-Faiz, A., H. Dounas, A. Meddich, M. Hafidi, and A. Ouhammou. "Biodiversity of the public green spaces in the Urban District of Marrakesh (UDM)(Morocco)." *Acta Botanica Malacitana* 41 (2016): 83-100.

economic development in Tanzania in the region.[20] The development of new roads and infrastructure in the country requires careful planning so as not to jeopardize the country's sources of foreign revenue from tourism. In a study on balancing conservation and national development in Tanzania, Grant, Hopcraft and others[21] examined the impact of the construction of the Serengeti Road on the Serengeti-Ngorongoro ecosystem which is one of the world's most famous protected natural ecosystems According to the findings of the study, the construction of the road had the potential to reduce the wildebeest population by 30% which would permanently change the dynamics of this ecosystem.

In Kenya, Nyumba, Sang and others recognize the economic, social and cultural role played by infrastructural developments in urban areas.[22] They however cite the impact of these infrastructural developments on natural ecosystems. In a qualitative examination of the impact of the standard gauge railway Construction in Kenya, they established that even though the railway covers a small portion along the SGR corridor, a significant portion of this area supports a wide range of ecologically fragile and key ecosystems in the country.[23] They established that its construction has caused environmental degradation, ecosystem fragmentation and ecosystem destruction with ecosystem degradation being the most significant impact of the construction of the railway line. Impacts included destruction of key water towers, protected areas, community conservancies and wildlife dispersal areas.

A review of more existing studies in Kenya shows that Mercy Lagat studied UGS physical encroachment in Kenya and concluded that physical expansion caused the loss of UGS in Kisumu and Eldoret by transforming them into urbanized areas.[24]Ouko et al. centered their research on the perceptions of residents of the ES supplied by forest and how they engage in their management. They concluded that the absence of local community input in forest

[20] Hopcraft JGC, Bigurube G, Lembeli JD, Borner M: "Balancing Conservation with National Development: A Socio-Economic Case Study of the Alternatives to the Serengeti Road." *PLoS ONE* 10(7) (2015)

[21] ibid

[22] Nyumba TO, Sang CC, Olago DO, Marchant R, Waruingi L, Githiora Y, et al: "Assessing the ecological impacts of transportation infrastructure development: A reconnaissance study of the Standard Gauge Railway in Kenya." *PLoS ONE* 16(1) (2021).

[23] ibid

[24] Mercy Jeptum Lagat, 'URBAN GREEN SPACES STATUS AND CHANGES OVER TIME: THE CASE OF KISUMU AND ELDORET TOWNS.' (Thesis, University of Eldoret 2021) <http://41.89.164.27:8080/xmlui/handle/123456789/1042> accessed 29 September 2022.

management may have led to unsustainable resource extraction.[25] Risper Khanani analyzed how changes to road infrastructure are affecting economic growth and socio-spatial landscapes in peri-urban Kisumu and concluded that the effects of road infrastructure appear to vary by location and social class within peri-urban areas.[26] Mary Wambui assessed Challenges Facing Urban Green Spaces and concluded that Nairobi City Park faces many challenges. The challenges were divided into three categories in the paper: environmental challenges, social challenges, and management challenges.[27]Additionally, while there is a wealth of existing research on transport infrastructure development impacts on green spaces, a gap still exists around green spaces loss due to infrastructure development projects in third world countries. This means that there isn't enough research in the local area to help people make good decisions about how to care for and manage green spaces and the benefits they provide.

In general, while the economy heavily relies on transportation infrastructure development projects for growth and expansion, green spaces are equally important in that they provide the framework for communities to maintain healthy livelihoods. In urban centers where the population is quite high, any small green space is tremendously important to the welfare of the residents. This overrides the increasing demand for infrastructural development projects such as housing, roads, railways, and other public utility infrastructure.

To ensure the coexistence of the infrastructure development and the protection of green spaces in the urban areas, particularly in developing countries like Kenya, environmental agencies propose the continued alignment of the legal framework with sustainable goals regarding environmental conservation. The available studies, however, have majored on ecosystem services but fail to show the connection between the continued expansion of transport infrastructure and its threat to the green spaces. Moreover, the studies conducted have different contexts and conducted in different counties in Kenya, but none has been done on stakeholder perception on the Nairobi Expressway impacts on green spaces within Nairobi. The empirical review is on the impacts of transport infrastructure development on green spaces and their

[25] Caroline A Ouko and others, 'Community Perceptions of Ecosystem Services and the Management of Mt. Marsabit Forest in Northern Kenya' (2018) 5 Environments 121 <https://www.mdpi.com/2076-3298/5/11/121> accessed 28 September 2022.

[26] Risper Sarah Khanani and others, 'The Impact of Road Infrastructure Development Projects on Local Communities in Peri-Urban Areas: The Case of Kisumu, Kenya and Accra, Ghana' (2021) 4 International Journal of Community Well-Being 33 <https://doi.org/10.1007/s42413-020-00077-4> accessed 28 September 2022.

[27] Mary Wambui Mwangi, 'An Assessment to The Challenges Facing Urban Green Spaces a Case of City Park in Nairobi' <http://localhost:8080/xmlui/handle/123456789/9384> accessed 29 September 2022.

ecosystem services have been viewed from environmental perspective as shown in the above literature however as Ouko et al. Contends the absence of stakeholder input in management of green spaces can lead to unstainable management of this green spaces where they centered their research on the perceptions of residents of the ES supplied by forest and how they engage in their management. [28] This study was based on this perspective which recommends inputs on stakeholders' engagement in protecting green spaces and their ecosystem services hence the primary objective of the study was to provide multiple stakeholder view on ways to balance infrastructure development and green spaces.

2.3 Legal Challenges of Transport Infrastructure Development

One of the most important aspects of regulatory requirements and compliance in sustainable infrastructure development is addressing conflicts between development and environmental protection. In order to strike a balance between the need for development and the preservation and protection of the environment, regulatory frameworks set forth rules and regulations.[29] This entails making certain that infrastructure projects comply with pertinent laws and rules designed to protect natural resources, minimize pollution, and preserve ecosystems. Infrastructure projects that have the potential to damage sensitive habitats, cause pollution in the air or water, or degrade natural resources may put development and environmental protection at odds.[30]

By requiring environmental impact assessments, permitting procedures, and adherence to certain environmental standards, regulations seek to resolve these tensions. Respecting the legal mandates set forth by the appropriate authorities is the essence of regulatory compliance. [31] This include getting the required licenses and permissions, abiding by environmental protection laws, and reaching predetermined performance benchmarks.

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[28] Caroline A Ouko and others, 'Community Perceptions of Ecosystem Services and the Management of Mt. Marsabit Forest in Northern Kenya' (2018) 5 Environments 121 <https://www.mdpi.com/2076-3298/5/11/121> accessed 28 September 2022.

[29] Castro, P., Carvalho, R. 'A Legal Approach to Fostering Green Infrastructure for Improved Water and Energy Efficiency.' In: Garcia, M.d.G., Cortês, A. (eds) Blue Planet Law. Sustainable Development Goals Series. [2023] Springer, Cham.

[30] Ibid

[31] Kremer, Peleg, Zoé Hamstead, Dagmar Haase, Timon McPhearson, Niki Frantzeskaki, Erik Andersson, Nadja Kabisch, et al. "Key Insights for the Future of Urban Ecosystem Services Research." *Ecology and Society* 21, no. 2 [2016].

Continuous oversight, documentation, and implementation are also included in compliance to guarantee that infrastructure projects uphold environmental norms during their lifetime.[32] In order to resolve conflicts between environmental protection and development, stakeholders including communities, regulatory bodies, and environmental organizations must be involved as well as possible effects must be carefully considered and mitigation techniques must be implemented.[33] Strong legal frameworks that offer precise instructions and promote open decision-making procedures are essential for striking a balance between environmental protection and development. [34] Sustainable infrastructure projects can reduce their environmental impact, protect natural ecosystems, and help create a more sustainable future by resolving conflicts and assuring regulatory compliance.

The legal difficulties in striking a balance between infrastructure expansion and conservation have been highlighted by a number of writers. In a review of important findings for the future of urban ecosystems. Kremer and others [35] conducted research in several European and American nations. They found that there are issues with the comprehension, operationalization, and application of ecosystem frameworks in urban environmental planning, as well as a lack of regulatory body integration into a framework that fully recognizes the multifaceted advantages of urban green spaces. Similar to this, Eshetu et al.,[36] in Ethiopia found that institutional and regulatory barriers are the main obstacles to the actual planning and execution of green space policies. They understand how crucial it is to involve institutions in the process of creating plans for green spaces. One of the main challenges facing the city's green space development plan and its implementation is the absence of fully participating institutions during the plan's preparation. The authors of this study concluded that institutional and regulatory issues resulting from poor communication between institutions and frequent

[32] Ibid

[33] Rosa, A.; Karuuturi, V.S.; Balakrishnn, M.; Hamid, S. 'Geo-spatial Approach for Urban green space and Environmental quality assessment: A case study in Addis Ababa city.' J. Geogr. Inf. Syst. [2017], *9*, 191–206

[34] Ibid

[35] Kremer, Peleg, Zoé Hamstead, Dagmar Haase, Timon McPhearson, Niki Frantzeskaki, Erik Andersson, Nadja Kabisch, et al. "Key Insights for the Future of Urban Ecosystem Services Research." Ecology and Society 21, no. 2 [2016]

[36] Eshetu, Shibire Bekele, Kumelachew Yeshitela, and Stefan Sieber. 'Urban Green Space Planning, Policy Implementation, and Challenges: The Case of Addis Ababa.' Sustainability [2021] 13, no. 20: 11344.

institutional reorganizations which incite conflict between these institutions and their roles—were to blame for the destruction of green spaces in Addis Ababa.

The fact that certain urban planning policies in Africa are out of date and do not adequately reflect the present trends in urban growth might be attributed to their dysfunctional nature.[37] It was found that some of the urban planning laws in place in several Sub-Saharan African nations were created roughly 60 years ago in accordance with the planning laws of their former colonial overlords, the British, French, and Germans.[38] For instance, the 1945 Town and Country Planning Ordinance of Ghana, the 1946 Town Planning Ordinance of Nigeria, the 1948 Town Planning Act of Malawi,[39] and the 1956 Town Planning Ordinance of Tanzania[40]are all still in effect. It is challenging for existing regulations to fully address some of the current issues with urban development, such as the increasing urbanization and the rapid loss of green spaces, because little to no revisions have been made to them. Additionally, master plans are used to manage metropolitan areas in the majority of African countries. The master plan depicts the future urban shape that is intended to be realized on a map.[41] The excessive degradation of green spaces brought about by urban growth in Africa is one of the new difficulties that these master plans are unable to address. This is due to the fact that the majority of these master plans are antiquated, inflexible, and were created without the input of larger stakeholders, such as the local community. Abuja, Nigeria, is continually developing physically based on a master plan created in the 1970s.[42] Additionally, it was discovered that the 1944 master plan for Accra, Ghana, amended in 1957, and the 1968 master plan for Lusaka, Zambia, created by Doxiadis,

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[37] Adjei Collins Mensah. 'Urban Green Spaces in Africa: Nature and Challenges.' International Journal of Ecosystems. [2014] 4(1): 1-11

[38] Awuah, K. G. B., Hammond, F. N., Block, R., Proverbs, D., Booth, C. et al. 'Sub- Saharan Africa urban land use planning systems: The need for an economic appraisal.'[2010] A paper presented at the Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors. Paris, September 2-3.

[39] Njoh, A. J. 'Urban planning as a tool of power and social control in colonial Africa. Planning Perspectives,' [2009] 24(3), 301 – 317

[40] Kironde J. M. L., 'The regulatory framework, unplanned development and urban poverty: Findings from Dar es Salaam, Tanzania.' Land Use Policy, [2006] 23, 460 –472

[41] UN Habitat, 'Global report on human settlements 2009: Planning sustainable cities' [2009]. London: Earthscan

[42] Ibid

were still in use.[43] Many green spaces are being massively encroached upon as a result of the patterns.

Poor implementation of land planning restrictions on green areas exacerbated the issue of inadequate urban planning regulations in Africa. It was discovered that the root causes of this issue were a lack of cooperation amongst planning agencies, inadequate logistics, financial limits, and a shortage of competent labour. [44] In Addis Ababa, it was discovered that a lack of cooperation among government agencies, private organizations, and non-governmental organizations (NGOs) had a detrimental effect on the preservation of urban parks.[45] It was also discovered that many West African nations' collaboration and cooperation on green spaces between public and private organizations was in poor shape.[46] This is because most West African city administrations do not view private organizations as significant players in green areas, and as a result, they frequently make decisions without the active participation of the private sector. The degradation of green areas in Harare, the capital city of Zimbabwe, has been linked to poor coordination among the many planning organizations, and a lack of communication between the institutions has been identified as the cause of this.[47]

Investigating further into the inadequate implementation of planning laws pertaining to green spaces in Africa, it was found that the majority of African institutions are primarily concerned about issues related to unprepared skilled individuals, insufficient staffing levels, financial constraints, and a lack of logistics. These problems were among the main conclusions drawn from Addis Ababa, Ethiopia, where the agencies in charge of green spaces faced severe financial limits in addition to a manpower shortfall.[48] Similar to this, the organization in charge of Abidjan's Parks and Gardens was severely hampered by underqualified staff and inefficient

[43] Ibid

[44] Njoh, A. J. 'Urban planning as a tool of power and social control in colonial Africa. Planning Perspectives,' [2009] 24(3), 301 – 317

[45] Mpofu, T. P. Z., 'Environmental challenges of urbanisation: A case study for open green space management.' Research Journal of Agricultural and Environmental Management, [2013] 2(4), 105-110

[46] Fuwape, J. P., and Onyekwelu, J. C. 'Urban Forest Development in West Africa: Benefits and Challenges.' Journal of Biodiversity and Ecological Sciences, [2011] 1(1), 78-94

[47] Muderere, T. 'Natural co-existence or confinement: Challenges in integrating bird-life concerns into urban planning and design for Zimbabwe.' Journal of Sustainable Development in Africa [2011] 13(1), 162-183

[48] Olaleye, D. O., Ayoade, O. J., and Omisoro, E. O. 'A multivariate analysis of factors influencing green space provision in residential neighbourhood of Sub-Saharan Africa.' Journal of Environment and Earth Science, [2013] 3(5), 138-146

finances.[49] The circumstances in Kumasi and the other Ghanaian cities were the same. It was discovered that the Department of Parks and Gardens, the government organization in charge of creating and maintaining green spaces, was in dire need of funding to carry out their planned operations, grossly inadequate staff, and numerous essential pieces of equipment.[50] Many African organizations that deal with green spaces find it challenging to enact policies to protect green spaces and to strictly implement legislation pertaining to them. In the above literature review various legal challenges in several developing countries have been highlighted existing challenges in regulatory integration, they highlight the critical role of involve regulatory institutions in urban and green space planning. By critically analysing the existing legal and institutional framework for safeguarding green spaces in Kenya, this study critically examined existing legal framework highlighting challenges and insistencies in law and its implementation in the proper governing of green spaces. These gaps are highlighted in the next subsection.

2.4 Legal and Institutional Framework for Safeguarding Green Spaces in Kenya

2.4.1 The Constitution of Kenya 2010

The constitution of Kenya (2010) is the supreme law of Kenya with a significant focus on matters related to land, land use planning, and the environment. The preamble of the Kenyan constitution acknowledges the significance of the environment and calls on all citizens to practice sustainable environmental management.[51] Kenya's 2010 constitution underscores the importance of sustainable development adhering to both legal and procedural human rights; public participation, engaging key stakeholders at all levels of development and adoption of international law as part of Kenya's law and implementing all international environmental governance principles. Kenya's aim is to strike a balance between, economic development, and social well-being in all its mega- infrastructure development projects.[52]

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[49] Djibril, C., Coulibaly, A., Wang, X., and Ousmane, D., 2012, Evaluating green space use and management in Abidjan City, Cote D'lvoire. International Journal of Economics and Management Engineering, 2(3), 108-116.

[50] Ibid

[51] 'Const2010' <http://www.kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=Const2010> accessed 19 September 2022.

[52] 'Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in the Wake of Mega-Infrastructural Projects Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' <https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=18&id=&page=> accessed 11 May 2021.

Kameri-Mbote et al, supports this by stating that these international environmental governance principles, constitutional provisions together with the SDGs targets encourage that the relationship between social, economic, and environmental aspects be kept in balance during the establishment and consummation of projects. The processes and steps implemented in large-scale projects can either help secure a balance between the three aspects of sustainable development or impede the entire agenda. Transparency, responsibility, and accountability are critical for helping to bring about the sought-after balance and make reasonable environmental governance possible.[53]

The Constitution outlines important duties to be fulfilled to promote the responsible use of natural resources such as green spaces and preservation of the environment. These obligations apply not only to the government, but also to individuals. The Constitution of Kenya, adopted in 2010, incorporates a holistic approach to environmental protection by recognizing it as a fundamental human right.[54] This fundamental principle traces its origins back to the Stockholm Declaration of 1972.[55] Though there may be boundaries set by sectoral laws, the constitutional provisions ensure the fundamental right to a "clean and healthy environment", which also include protecting the environment for current and future generations. To ensure effective environmental management, the Constitution encourages public participation and establishes guidelines for environmental impact assessments (EIA), audits, and monitoring.

International agreements such as the Rio Declaration,[56] Agenda 21 and our very own Constitution emphasize the crucial importance of public participation. To achieve "a clean and healthy environment", the Constitution lays the groundwork for EIA, environmental audits and monitoring, and public participation in decision-making. Consequently, public cooperation is necessary to ensure that EIAs are conducted. Additionally, an EIA would be required to

[53] Patricia Kameri-Mbote, Hadijah Yahyah and Muriuki Muriungi, 'Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in the Wake of Mega-Infrastructural Projects' (2019) 2019 East African Law Journal 1 <https://heinonline.org/HOL/Page?handle=hein.journals/easfrilaj2019&id=242&div=&collection=>.

[54] Dr Kariuki Muigua, 'Implementing Constitutional Provisions on Natural Resources and Environmental Management in Kenya'.

[55] 'Stockholm Declaration: Declaration on the Human Environment' <https://wedocs.unep.org/handle/20.500.11822/29567> accessed 27 November 2023.

[56] ibid.

eliminate processes and activities that pose an environmental risk and threaten green spaces.[57] Furthermore, Article 35 and 69(1)(d) of the Constitution require involvement of the public in all decision, including the EIA process, as well as accurate information about any intended decision to be provided to the public in a timely and open manner. Everyone, particularly those who are expected to be directly affected by development projects such as the Expressway, is granted the right to take part in the decision-making process. Public participation is deemed to be a central idea of proper environmental management and securing green spaces and their ecosystem services. [58] Linda Kosgei highlights that the Constitution serves as groundwork for EIA, environmental monitoring and ensuring public involvement in the decision-making framework to accomplish a clean and healthy environment. Hence, the cooperation of everyone is necessary to ensure that EIA is considered. The responsibility to eradicate processes, activities or any undertakings that may put the environment in danger would also necessitate that an EIA is undertaken.[59] Kariuki Muigua, analysis of the law critiques this by highlighting that, despite the Constitution requiring communities and the state to collaborate, decision making appears to be mostly top-down, with communities only given the opportunity to apply for resource user rights and little to no consultations on management and governance issues.[60]

Furthermore, it prohibits any processes or activities that put the environment in danger and emphasizes on utilization of environment and its natural resources such as the green spaces for the benefit of the Kenyans.[61]There is a duty placed upon every individual by Article 69(2),[62] to collaborate with state institutions in the pursuit of environmental preservation and

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[57] 'EIA as a Tool for Balancing Economic, Social & Environmental Considerations in Infrastructure Development: The Case of Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' <https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=23&id=&page=> accessed 19 September 2022.

[58] Mbote, P. K., Yahyah, H., & Muriungi, M. (2019). Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in The Wake of Mega-infrastructural Projects. Special Issue on the Impacts of the Nairobi Expressway on the Rights of People; East African Law Journal, Pp. 1-22.

[59] Linda Kosgei and Marrian Mutete Kioko-Mutinda, 'EIA as a Tool for Balancing Economic, Social & Environmental Considerations in Infrastructure Development: The Case of Nairobi Expressway' (2019) 2019 East African Law Journal 82 <https://heinonline.org/HOL/Page?handle=hein.journals/easfrilaj2019&id=323&div=&collection=>.

[60] Kariuki Muigua, 'Enhancing Environmental Governance through Law and Other Tools: The Efficacy of Kenya's Environmental Management and Coordination Act'.

[61] Art. 69(1) of the Constitution of Kenya 2010

[62] 'Kenya Law: The Constitution of Kenya' <http://kenyalaw.org/kl/index.php?id=398> accessed 27 November 2023.

sustainable development. According to P. Kameri's study of access to environmental justice, even with this provision, the constitution does not assure that these rights would be enjoyed until there is access to justice, which it then grants the right to seek legal recourse in matters concerning the environment.[63] The Constitution encourages an engaged and empowered community, enabling citizens to actively participate in conservation efforts through legal action.[64] This was affirmed in the *Joseph Leboo & 2 Others case v Director of Kenya Forest Services & Another* (2013), when the Court stated that there is no prerequisite of demonstrating personal harm or loss for bringing an action to protect the environment.[65] This was also the case in the Environment Coordination and Management Act that preceded the Constitution of Kenya. Section 3(4) grants anyone the right to initiate legal action to protect the environment without the need to demonstrate personal loss or injury. Any person has the right to seek legal redress in cases where the environment is threatened or regarding assaulted ecosystems. PIL has copious potential to shelter public spaces from alienation and transformational altering. Furthermore, PIL may be applied to dispute the poor compliance of developmental structures with the prerequisites for environmental assessment such as the environmental impact assessment (EIA) and the strategic environmental assessment (SEA), permit a reconciling of social, economic, and ecologic features in transport infrastructure development project, thus protecting and preserving green spaces and their ecosystem services.[66]

Specifically, the Constitution outlines various duties of the state, which include safeguarding the environment, natural resources including green spaces through sustainable exploitation, utilization, management, and conservation.[67] Additionally, the constitution guarantees the equitable distribution of benefits derived from these green spaces and other natural resources and mandates the maintenance of a minimum of 10% tree coverage across the land. It also emphasizes the protection of intellectual property and indigenous knowledge related to

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[63] Patricia Kameri-Mbote, 'Towards Greater Access to Justice in Environmental Disputes in Kenya'.

[64] Art. 22(1) of the Constitution of Kenya 2010

[65] 'Environment and Land Case 273 of 2013 - Kenya Law' <http://kenyalaw.org/caselaw/cases/view/83783/> accessed 26 September 2023.

[66] Mbote, P. K., Yahyah, H., & Muriungi, M. (2019). Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in The Wake of Mega-infrastructural Projects. Special Issue on the Impacts of the Nairobi Expressway on the Rights of People; East African Law Journal, Pp. 1-22.

[67] The Constitution interprets "natural resources" to mean the physical non-human factors and components, whether renewable or non-renewable, including sunlight; surface and groundwater; forests, biodiversity and genetic resources; and rocks, minerals, fossil fuels and other sources of energy (Art. 260). Art.260 'Kenya Law: The Constitution of Kenya' (n 137).

biodiversity. Although the Constitution does not explicitly outline the role of communities in environmental governance, it does grant them the right to seek legal remedies. Therefore, it is imperative that our environmental laws are aligned with the Constitution to ensure that communities can effectively participate in environmental protection and conservation initiatives.

2.4.2 The Environmental Management and Coordination Act (EMCA) of 1999

The Environmental Management and Coordination Act (EMCA) of 1999, amended in 2015, serves as the main fundamental environmental law of Kenya that governs environmental conservation and sustainable environmental management in the country.[68] Its core purpose is to set up environmental legal and institutional architecture to effectively coordinate and manage all environmental issues.[69] Prior to the passing of the EMCA, Kenya lacked a comprehensive legislation governing environmental matters, hence enacted EMCA to fix all the issues pertaining to environmental regulations.[70] Contrary to this expectation EMCA has failed to deliver on its mandate, as the process of enacting the necessary laws and regulations is still incomplete, [71] there is little headway in unifying the various regulatory frameworks for various environmental resources. [72] K.Muigua, recent review on efficacy of Kenya's EMCA, [73] highlighted that there is a disconnect between the existing environmental management legal and institutional configuration due to fragmentation responsibilities taken up by different entities on different environmental management concerns. This diversification of environmental legislation gives the impression that laws and institutions are insufficient to manage environmental challenges. The revision of EMCA, as well as the consolidation of other important sectoral laws, would allow for a more streamlined examination of the legislation's and institutions' effectiveness in protecting the environment. This will result in effective law

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[68] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' (n 40).

[69] Muigua, 'Enhancing Environmental Governance through Law and Other Tools: The Efficacy of Kenya's Environmental Management and Coordination Act' (n 135).

[70] Benjamin Barczewski, 'How Well Do Environmental Regulations Work in Kenya? : A Case Study of the Thika Highway Improvement Project'.

[71] 'Sessional-Paper-No.-10-of-2012-On-Kenya-Vision-2030.Pdf' <https://vision2030.go.ke/wp-content/uploads/2018/05/Sessional-paper-No.-10-of-2012-On-Kenya-Vision-2030.pdf> accessed 29 November 2023.

[72] Muigua, 'Enhancing Environmental Governance through Law and Other Tools: The Efficacy of Kenya's Environmental Management and Coordination Act' (n 135).

[73] ibid.

enforcement through specified entities. Many concerns remain unresolved in the present legal and institutional architecture, including overlapping mandates. Consequently, there is a significant challenge in implementing environmental laws and institutional reforms to ensure stricter enforcement, which must be addressed.[74] Integrating sectoral environmental laws, environmental management institution priorities are vital in balancing priorities and decision making when it comes to environment and development.

EMCA rests upon the foundational premise that every human being holds the entitlement to an uncontaminated and hygienic environment, this includes protection of the green spaces and their ecosystem services. If any such entitlement is infringed, they have the legitimate ability to seek redress. In terms of environmental entities, the National Environment Management Authority (NEMA) is the primary government body in responsibility of environmental protection. The mission of NEMA is to execute EMCA and to manage overall environmental protection concerns with other government agencies. Another environmental regulatory body is the National Environment Tribunal (NET). The NET is tasked with evaluating NEMA administrative decisions connected to licensing and providing NEMA with legal views on challenging problems.[75]

Pursuant to Section 58 of the Act, any proponent intending to undertake an activity listed in the Legislation's second schedule is obliged to conduct an Environmental and Social Impact Assessment (ESIA).Projects of this type run the risk of inflicting substantial environmental effects, infrastructure development projects such as the Nairobi Expressway have an enormous potential for environmental degradation hence falls under this requirement.[76] Likewise, Section 68 of the same Act dictates that operators of current projects or undertakings must complete annual environmental audits. Said audits evaluate the degree to which commitments outlined in the ESIA process have been satisfied. The Nairobi Expressway development is considered a high-risk project hence an Environmental and Social Impact Analysis (ESIA) was undertaken, as outlined in the Act.

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[74] 'Sessional-Paper-No.-10-of-2012-On-Kenya-Vision-2030.Pdf' (n 146).

[75]Section 125-136, of 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/EnvironmentalManagementandCo-ordinationAct_No8of1999.pdf> accessed 27 November 2023.

[76] Mbote, P. K., Yahyah, H., & Muriungi, M. (2019). Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in The Wake of Mega-infrastructural Projects. Special Issue on the Impacts of the Nairobi Expressway on the Rights of People; East African Law Journal, Pp. 1-22.

Environmental standards and guidelines have been developed under EMCA. These are Air Quality Regulations, Water Quality Regulations, Waste Management Regulations, Noise and Excessive Vibration Pollution (Control) Regulations, Conservation of Biological Diversity and Resources, Access to Genetic Resources and Benefit Sharing Regulations, Environmental Impact Assessment (EIA) Regulations, EIA Guidelines, and Strategic Environmental Assessments (SEA) Guidelines.

a) **The Environmental (impact assessment and audit) Regulations, 2003 (EIA Guidelines, and Strategic Environmental Assessments (SEA) Guidelines)**

To protect and conserve the environment from human activities that might cause harm to the natural environment, EMCA provides for Environmental Impact Assessments (EIA), Strategic Environmental Assessments (SEA), Environmental Audits (EA), and Environmental Monitoring (EM). [77] EMCA defines EIA as "a systematic examination conducted to determine whether or not a programme, activity or project will have any adverse impacts on the environment",[78] and SEA is defined as "a formal and systematic process to analyze and address the environmental effects of policies, plans, programmes and other strategic initiatives".[79] EIA are widely recognized as vital tools for ensuring sustainable development. By evaluating the ecological, social, and economic ramifications of proposed developments, they aid in avoiding or mitigating any unwelcome environmental effects.[80] Kenya's environmental management efforts are firmly grounded in the EIA process because of the implementation of the EMCA and EIA regulations. T. Kibutu and A. Mwenda examined EIA provisions in Kenyan legislation and concluded that the presence of legislation guiding the EIA process in Kenya meets a critical criterion for efficient environmental management.[81] Additionally, that during evaluation of how effective the EIA system, there are three key things that demonstrate effectiveness is presence of EIA legal framework, provisions for procedural specifications on public

[77] Muigua, 'Enhancing Environmental Governance through Law and Other Tools: The Efficacy of Kenya's Environmental Management and Coordination Act' (n 135).

[78] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' section 3 <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/EnvironmentalManagementandCo-ordinationAct_No8of1999.pdf> accessed 26 September 2023.

[79] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' (n 153).

[80] 'Environmental Impact Assessment as a Tool for Sustainable Development | SpringerLink' <https://link.springer.com/referenceworkentry/10.1007/978-3-030-11352-0_170> accessed 18 September 2023.

[81] Thomas Kibutu and Angela Mwenda, 'Provision for Environmental Impact Assessment (EIA) in Kenya's Legislation: A Review of the Environmental Management & Coordination Act (EMCA) and Environmental (Impact Assessment & Audit) Regulations (EIAAR)'.

consultations during the study phase and when and how to seek legal redress against decisions on EIA in case of complaints, and Kenya EIA regulations meet this requirements hence deemed efficient.

According to K.Muigua, EIA incorporates aspects of independence and impartiality while allowing various stakeholders to review and contribute to decision-making.[82]Additionally, it helps decision-makers strike a balance between developmental and environmental needs by providing them with additional information. EIA promotes public engagement as well since, given the option to express their views, stakeholders are likely to be more receptive to the decisions made by the authorities. EMCA necessitates that a project proponent conducts an environmental impact assessment (EIA) and apply for an EIA license prior to commencing any project works as specified in the second schedule and submit a report. For projects specified in the second schedule a full EIA study must be completed and an EIA report submitted to NEMA for approval. In some cases, however NEMA may direct the project proponent to forego EIA study. [83] NEMA only issue the EIA license after reviewing the EIA study report and ascertaining it meets all the requirements.[84] This important process in EIA review ensures that the proponent is only given a go ahead to proceed with the project after issuance of the license. After receiving the EIA license the proponent becomes fully responsible for adhering to the terms and conditions in the license. Additionally, the proponent is expected to conduct monitoring and audits through out the life cycle of the project.[85] This is meant to ensure mitigation measures are implemented from start of the project to commissioning and operation stage hence protecting the environment from harm. The goal of SEA on the other hand is to improve environmental protection and promote sustainable development by assisting in the incorporation of environmental issues into the development and implementation of specific policies, plans, and programmes. [86] SEA not only examines environmental issues but additionally, the intersects economic and social matters. [87]

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[82] Muigua, 'Enhancing Environmental Governance through Law and Other Tools: The Efficacy of Kenya's Environmental Management and Coordination Act' (n 135).

[83] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' .

[84] Kibutu and Mwenda (n 156).

[85] ibid.

[86] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' .

[87] ibid.

A study by Kosgei and Kioko depicts that's evidence show that EIA is a system for identifying the expected or actual consequences of any activity on the environment to direct authorities while making decisions that may have a significant after-effect on the environment.[88]A link between the environment and development is clear, as environmental degradation may jeopardize economic progress by creating a connection between environmental pressures and economic development trends. Additionally, an affordable estimation of the harm done to our environment must be included in development considerations to protect the environment. Like any other tool the use of EIA as a mechanism for achieving sustainable development goals faces several constraints.

Benjamin Barczewski study highlights some of these constraints.[89] One of these restrictions is the current EIA legal framework, which stipulates that the proponent must hire an EIA lead expert with a NEMA license to conduct the assessment on the proponent's behalf. This requirement creates a dependable and coercive relationship, casting doubt on the lead expert's relationship with the proponent. This is because the proponent hires the NEMA lead expert, who then expects payment upon completion of the anticipated EIA study. This creates an opportunity for the NEMA lead to be biased towards producing an EIA report that benefits the proponent and may minimize the actual environmental impacts of the proposed project. The lead expert is typically under pressure to keep business relations with the proponent because a negative EIA report could force the project to be redesigned or even abandoned. The second limitation is the propensity of the NEMA Lead experts to make shortcuts. For instance, they may create templates for EIA reports and duplicate this data across projects, skipping site inspections and lightening their burden in the process. Additional issues surround improper public participation practices, which typically involve lead experts giving out questionnaires for people who will be impacted by the project to complete. Rather than going through the proper channels, the lead expert may choose to solicit friends or coworkers to complete the comment sections, rendering them inappropriate. Note that any lead expert found engaging in the behavior could have their license to practice revoked. Although these are not widespread practices, they do occur, and we cannot ignore this malpractice. Although this potentially dishonest practice is acknowledged, there aren't many systems in place to catch such behavior.

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[88] Linda Kosgei and Marrian Mutete Kioko-Mutinda, 'EIA as a Tool for Balancing Economic, Social & Environmental Considerations in Infrastructure Development: The Case of Nairobi Expressway' (2019) 2019 East African Law Journal 82

[89] Barczewski (n 145).

Losing a lead expert license is a deterrent, but it isn't always effective because it can be difficult to spot carefully crafted copies in environmental impact assessments. To maintain the integrity of the EIA procedure and the dependability of environmental impact assessments in Kenya, there are systemic problems with the current regulatory framework that need to be addressed.[90]

The EIA shortcomings were evident during the review of Nairobi Expressway project Environmental Impact Assessment Study Report (EIASR). [91] The Environmental Impact Assessment (EIA) conducted for the Nairobi Expressway project identified the possible negative impacts on Uhuru Park and offered an alternate path that avoided the park, among other advantages. However, EIA has its own limitations when addressing combined influence and contrasting different options. This stresses the significance of Strategic Environmental Assessment (SEA), which detects impacts at the policy, planning, or program level when various choices are available. SEA is crucial in ensuring sustainable development. To counter this, the EIA suggested that the government should take a post-evaluation Strategic Environmental Assessment of the blueprint of the Transport Sector. This would better the Environmental Impact Assessment for the Nairobi Expressway. Additionally, it stated that public involvement in environmental assessments increases ownership of development project decisions. [92] Engaging the public would bring up discussions around governing green spaces, the value of urban green spaces in urban areas, and the need to balance environment, economic, social, considerations. Both SEA and EIA can be helpful implements to make this balance in infrastructure development and assist in guarding green areas. This will help ensure green spaces are protected even in the face of infrastructure development.[93]

Richard Mulwa, state that the Nairobi Expressway project adhered to Section 58 of the EMCA Act 1999 that state that "the proponent of any project shall undertake a full environmental impact assessment (EIA) study and submit an environmental impact assessment study report to the NEMA prior to being issued with any license by the Authority." He also adds that an

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[90] ibid.

[91] Kosgei, Linda., Mutete, Mutinda. 'EIA as a Tool for Balancing Economic, Social and Environmental Considerations in Infrastructure Development: The Case of Nairobi Expressway, [2019] East Africa Law Journal 82
<https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=23&id=&page=>

[92] 'Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in the Wake of Mega-Infrastructural Projects Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 127).

[93] ibid.

EIA may not be insufficient for projects with immense scale and capacity to degrade the environment like the Nairobi Expressway. Hence the law should include a segment of environmental valuation, with reports depositing all depreciations in monetary worth so that the environmental impacts can be weighed out with those of traditional goods and services appraised at market values.[94] A study by J. Burger,[95] highlights that ecosystem evaluation has grown in popularity and importance in evaluating and integrating the various processes involved in natural resource preservation and management. This is especially true considering global developments such as global warming and climate change, the loss of habitats and major biomes, and population densities and developments. These environmental issues necessitate the combination of many environmental management disciplines and methodologies. According to R. Hejazi's paper on the Application of the Economic Valuation Method in the Environmental Impact Assessment Procedure,[96] the objective of environmental economic valuation is to strengthen the links between the environment and the economy and to achieve sustainable development. The research highlights the Contingent Valuation Method (CVM) as one of the most often utilized environmental economic valuation methodologies, and it is frequently used in cost-benefit analysis (CBA) and environmental impact assessment. It is necessary to quantify specific impacts in monetary terms throughout the project's life cycle, as EIA frequently focuses on the project's building phase. Combining economic evaluation tools and EIA share the same basic goal of assisting decision-making on the environmental concerns of a large project. One of the disadvantages of EIA is the low quantity of results. Using an economic value tool can address this weakness, strengthening EIA.[97]

Benjamin Barczewski study highlights that, Kenya's pursuit of infrastructure developments has highlighted the need for effective environmental regulation, as seen in the Nairobi-Thika Highway Improvement Project. He goes ahead and contest that Kenya's current system of environmental regulation is lacking in key areas, including inadequate funding, corruption, and

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[94] 'When Urban Green Spaces Meet Infrastructure Development in Kenya: A Case of the Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 2).

[95] Joanna Burger, 'Environmental Management: Integrating Ecological Evaluation, Remediation, Restoration, Natural Resource Damage Assessment and Long-Term Stewardship on Contaminated Lands' (2008) 400 Science of The Total Environment 6 <https://www.sciencedirect.com/science/article/pii/S0048969708006931> accessed 29 November 2023.

[96] Rokhshad Hejazi, 'Application of Economic Valuation Method in the Environmental Impact Assessment Procedure' (2014) 8 Asian Journal of Agricultural Research.

[97] ibid.

a lack of engagement with community stakeholders. The Nairobi-Thika Highway Improvement Project (NTHIP) highlights the need for effective environmental regulation. The relationship between the lead expert conducting the Environmental Impact Assessment (EIA) study and the project proponent is potentially coercive, leading to downplaying of environmental impacts. Kenya's legal and institutional framework is robust, but there are gaps and weaknesses. The National Environmental Management Authority (NEMA) has the tools to protect the environment, but there are issues with oversight and engagement. Barczewski recommends that a new funding plan for NEMA needs to be developed, ensuring well-funded and staffed agencies, appointing committees to streamline regulations, enforcing transparency, and supporting community groups. [98] The NTHIP case study reveals that Keya has adequate regulations to protect the environment the gap is in implementation of these regulations hence there is need for improvement.[99]

Kakonge, review on why EIA fails in Kenya builds up to Barczewski review by indicating that for over four decades, Environmental Impact Assessments (EIAs) have been accepted as a vital part of project preparation.[100] Numerous African nations, including Kenya, have passed laws requiring EIAs to be undertaken on massive, potentially environmentally damaging projects. Unfortunately, the effects of such assessments are frequently inadequate and not as effective as had been hoped. Despite this, the Environmental Impact Assessment (EIA) process has drawn a tremendous amount of criticism. According to Kakonge, major projects such as the Thika Superhighway and the Lamu Port have been built without proper EIAs. He attests that inferior quality EIAs are ubiquitous in Kenya as the reports are perceived as sales pitches for developers and regarded as a mere formality to obtain permits. The core problems linked to EIAs include lack of competency, lack of political will, flawed public participation, bias, and corruption.[101]

The court Judgment rendered pertai"©ng 'o the Lamu Coal Plant and the Lamu Port South Sudan Ethiopian Transport (LAPSSET) Corridor ventures carries considerable legal weight.

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[98] Benjamin Barczewski, 'How Well Do Environmental Regulations Work in Kenya? : A Case Study of the Thika Highway Improvement Project'.

[99] ibid.

[100] 'Environmental Impact Assessment: Why It Fails in Kenya | Pambazuka News' (5 March 2016) <https://www.pambazuka.org/land-environment/environmental-impact-assessment-why-it-fails-kenya> accessed 27 September 2023.

[101] ibid.

The National Environmental Tribunal (NET) weighed in on this matter and subsequently, the High Court contributed its insights in the case, concerning the legal implications associated with Strategic Environmental Assessment (SEA).[102]

In the case of *Save Lamu et al. v. National Environmental Management Authority and Amu Power Co. Ltd*. A group of community members from Lamu filed an appeal against NEMA's decision to grant an Environmental Impact Assessment (EIA) license for the construction of a coal-fired power plant near an ecologically sensitive area. The appellants contested the legality of the entire EIA process, highlighting the failure of the project proponent to conduct a proper analysis of alternative project options, which they believed violated Regulation 16(b) and 18 of the Environmental (Impact Assessment and Audit) Regulations, 2003.[103]Referring to a precedent set by the High Court in the *Mohamed Ali Baadi and others vs. A.G. & 11 others case* [104] ,the National Environmental Tribunal (NET) underscored the significance of conducting a Strategic Environmental Assessment (SEA) to evaluate alternative project possibilities. The Tribunal determined that, as the coal plant was part of the larger LAPSSET project, there was a mandatory requirement for a SEA. The Tribunal reached its conclusion that NEMA had contravened the Environmental Impact Assessment & Audit Regulations as it dispensed the EIA Permit without duly conducting suitable and substantive public consultation as prescribed in the regulations.[105]This ruling underscored the importance of EIA and SEA, conducting a proper analysis of alternative project options, as well as identifying mitigations measures to all the negative environmental impacts. The two cases emphasized the significance of public participation in EIA/SEA. The involvement of the public in environmental decisions and policy and law making must be considered as important for distinct reasons. The decisions help to enrich and cross-fertilize environmental rights. Public participation can help identify and address environmental problems at an early stage.

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[102] 'Critical Considerations in Mega Development Projects in Africa: Making the Public Voice Count Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' <https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=19&id=&page=> accessed 27 September 2023.

[103] '20190626_Tribunal-Appeal-No.-Net-196-of-2016_decision. Pdf' <https://climatecasechart.com/wp-content/uploads/non-us-case-documents/2019/20190626_Tribunal-Appeal-No.-Net-196-of-2016_decision.pdf> accessed 18 September 2023.

[104] 'Petition 22 of 2012 - Kenya Law' <http://kenyalaw.org/caselaw/cases/view/156405> accessed 27 September 2023.

[105] '20190626_Tribunal-Appeal-No.-Net-196-of-2016_decision.Pdf' (n 178).

Despite the paramount importance of decision-making at high levels, it is also critical to address the impediments to public involvement that the complications at this tier present to the communities. Hence, even if input opportunities are provided to the public to participate, they might still be rendered powerless to take part due to these complexities and may not engage effectively. At the stage of strategic planning, where the wishes of the people ought to be integrated, processions for collaboration should be encouraged through the compilation and provision of adequate and satisfactory data to ensure relevant involvement in policymaking by communities. Providing the necessary details and information about the planned development is an essential element that should be incorporated into any operation of effective environmental governance and decision-making.[106]

b) The Environmental Management and Coordination (Air Quality) Regulations, 2014

Air quality regulation purpose is to address the prevention, control, and reduce of air pollution to ensure the presence of clean and healthy ambient air. The regulation establishes guidelines for emission standards applicable to a range of sources, including mobile sources such as vehicles and stationary sources like industrial facilities, in accordance with EMCA of 1999.[107]Under the Environmental Management and Coordination Act 1999 (EMCA),108 any projects or activities that have the potential to contribute to air pollution must undergo a thorough Environmental Impact Assessment (EIA). This critical step ensures that all proposed projects are carefully evaluated, with a specific focus on their environmental impacts, including air quality. By doing so, decision-makers can make well-informed choices that consider the potential effects on the environment. It also allows for the implementation of necessary

[106] 'Critical Considerations in Mega Development Projects in Africa: Making the Public Voice Count Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 177).

[107] 'Air Quality Regulations2014-1.Pdf' <http://www.nema.go.ke/images/Docs/Regulations/air%20quality%20regulations2014-1.pdf> accessed 18 September 2023.

[108] Sec 68, 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf' (n 150).

measures to mitigate or prevent any negative impacts on air quality and overall environmental well-being.

A study by Omanga, E., alt study,[109] highlights that there is limited air quality management systems in many of the developing nations such as Kenya, this is attribute to inadequate legislation, lack of good political will among other challenges. Achieving economic growth while also promoting environmental sustainability is a complex hurdle to overcome. In many cases, the allure of immediate profits and job opportunities overshadows the importance of investing in pollution prevention technologies. This can lead to a neglect in prioritizing pollution prevention efforts, resulting in inadequate air quality management capabilities and a lack of crucial pollution data. As a result, there may be a dangerous misconception that there are no urgent environmental concerns, hindering the much-needed implementation of measures to address air pollution.[110]

Mugendi,E,[111] builds to this argument by stating that like other SSA countries Nairobi experiences the same challenges, where air pollution is worsening and yet air quality is not consistently monitored. Despite the existence of regulations such as Kenya's 2014 Air Quality Regulations, the lack of systematic air quality monitoring makes it challenging to accurately measure the levels of particulate pollutants in urban areas. As a result, our understanding of the full extent of air pollution and its potential impact on both public health and the environment is limited. This data gap poses a significant barrier for authorities and policymakers in formulating effective responses to combat the dangers posed by hazardous air quality.[112] Without regular monitoring, it is impossible to pinpoint the sources of pollution and track its trends over time. Therefore, it is crucial to have consistent air quality monitoring in place to better identify, assess, and respond to this pressing issue.

Effective implementation of the 2014 Air Quality Regulations is crucial in ensuring a safe and pollution-free environment. The stringent enforcement of emission standards, mandated by

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[109] Eunice Omanga and others, 'Industrial Air Pollution in Rural Kenya: Community Awareness, Risk Perception and Associations between Risk Variables' (2014) 14 BMC Public Health 377 <https://doi.org/10.1186/1471-2458-14-377> accessed 27 November 2023.

[110] ibid.

[111] Eric Mugendi, 'Measuring Nairobi's Air Quality Using Locally Assembled Low-Cost Sensors' (*Code For Africa*, 23 May 2018) <https://medium.com/code-for-africa/measuring-nairobis-air-quality-using-locally-assembled-low-cost-sensors-94a356885120> accessed 27 November 2023.

[112] ibid.

both the Air Quality Regulations and the Environmental Management and Coordination Act of 1999, must be upheld for all sources, whether they be mobile (such as motor vehicles) or stationary (like industries). We cannot underestimate the importance of following these regulations.[113]

c) The Environmental Management and Coordination, (Water Quality) Regulations 2006

Water quality regulation 2006,[114] is applicable to drinking water, water for industrial use, water for agricultural use, water for recreational use, water for fisheries, wildlife, and other purposes. The 2006 regulation obligates every citizen to abstain from any action that can lead to water pollution, regardless of whether they are contributing to it directly or indirectly, additionally regulates the different water use and interaction through licensing. The water quality regulations state that if water contamination occurs without a valid permit or licence from the National Environment Management Authority (NEMA), it is considered a violation under the Water Quality Act of 2016. This offence is subject to punishment, including imprisonment and significant fines. Furthermore, the entity held accountable for the pollution is required to conduct the remediation process. As a prerequisite for obtaining a licence, NEMA charges a fee and mandates the involvement of local authorities, businesses, and lead agencies. Throughout this procedure, NEMA assesses the ecological consequences of the effluents or emissions, considering any previously issued licences in the vicinity. This comprehensive strategy guarantees a meticulous evaluation and efficient control of any environmental hazards linked to water contamination. [115]

According to Kariuki Muigua,[116] despite the existence of this regulation and the enactment of water Act 2006 that provides for framework to curb contamination and pollution of various water sources, there is still numerous water pollution cases resulting from lack of proper enforcement of the standards.

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[113] Kariuki Muigua, 'Safeguarding the Environment through Effective Pollution Control in Kenya'.

[114] Water quality regulation, 2006 'LN120_2006.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/LegalNotices/2006/LN120_2006.pdf> accessed 27 November 2023.

[115] Water quality regulation, 2006 ibid.

[116] Muigua, 'Safeguarding the Environment through Effective Pollution Control in Kenya' (n 188).

d) The Environmental Management and Coordination, (Waste Management) Regulations 2006

Waste management regulation 2006, [117] specify criteria for waste management procedures, such as handling, storage, transport, treatment, and disposal, concerning diverse waste streams. [118] According to part 4 (1), it is unlawful for any individual to dispose of rubbish in a public right-of-way, road, playground, or any other public area, except when it is put into a specifically allocated receptacle. Part 17 (1) stipulates that it is unlawful for individuals to undertake activities that could bring forth hazardous waste without attaining an Environmental Impact Assessment license that has been appropriated by the National Environment Management Agency (NEMA). Solid waste (hazardous and non-hazardous waste) was generated during construction and continues to be generated now during the operational phase of the Nairobi Expressway, which needs to be managed and disposed of as per this regulation's guidelines.[119]

e) The Environmental Management and Coordination (Noise and Excessive Vibration Pollution (Control) Regulations, 2009

Noise and Excessive Vibration Pollution (Control) Regulations, [120] defines noise as any undesired sound that may result to adverse effects on human health and on the environment. The 2009 regulation has provisions to ensure the good of everyone in Kenya by keeping the atmosphere healthy, boosting tranquility in their environment, and preserving their mental well-being. Explicitly, these regulations forbid the occurrence of loud, unreasonable, unnecessary, and unusual noises that can disturb, cause harm, annoy, or jeopardize the well-being, quietness, health, and safety of anybody in the environment or the environment itself. Any party participating in undertakings emitting sound or substantial tremors beyond the satisfactory levels is obligated to acquire a permit or license from the pertinent authority.[121]

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[117] 'Waste Management Regulations-1.Pdf' <http://www.nema.go.ke/images/Docs/Regulations/Waste%20Management%20Regulations-1.pdf> accessed 18 September 2023.

[118] ibid.

[119] 'EIA_1688_Vol-I-II_EIA-Study-Report-For-the-Proposed-Nairobi-Expressway-Project.Pdf' <https://naturaljustice.org/wp-content/uploads/2021/01/EIA_1688_Vol-I-II_EIA-Study-Report-For-the-Proposed-Nairobi-Expressway-Project.pdf> accessed 18 September 2023.

[120] 'Noise Regulations.Pdf' <http://www.nema.go.ke/images/Docs/Regulations/Noise%20regulations.pdf> accessed 18 September 2023.

[121] ibid.

f) The Environmental Management and Coordination (Conservation of Biological Diversity and Resources, and access to genetic resources and benefits sharing, 2006

Conservation of Biological Diversity and Resources, and access to genetic resources and benefits sharing Regulations, [122] were developed to protect biodiversity and resources, paying particular attention to genetic materials. Its purpose is to provide measures to protect species that are endangered or threatened, as well as to provide a legal framework for accessing genetic resources for lawful purposes. To engage in activities that may have negative effects on ecosystems, invasive species, or natural resources, it is required to get an Environmental Impact Assessment (EIA) permit from the National Environment Management Authority (NEMA). Moreover, these regulations specify the obligation of NEMA, in conjunction with other lead authorities, to conduct a thorough assessment of Kenya's biological variety. The objective of this inventory is to oversee and guarantee the preservation of all species inside the nation. Furthermore, the regulations mandate that any individual desiring to get genetic resources must apply for a permit from NEMA. This application process entails disseminating the application to both lead agencies and the public, thereby facilitating the gathering of comments and concerns. Prior to making a decision to approve or reject the application, the collected information is carefully evaluated, guaranteeing a fair and open procedure.[123]Green spaces such as Uhuru Park is considered as a biological diversity resource hence should be protected at all cost and environmental impacts associated with infrastructure development projects such as the Nairobi Expressway should be mitigated in order to conserve these spaces.

2.4.3 The Climate Change (Amendment) Act, 2023

The Climate Change (Amendment) Act of 2023,[124] build upon the previous Climate Change Act of 2016,[125] solidifying Kenya's dedication towards meeting its obligations under the Paris

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[122]'Biodiversitybenefitsharingregulations_1.Pdf' <http://www.nema.go.ke/images/Docs/Regulations/Biodiversitybenefitsharingregulations_1.pdf> accessed 18 September 2023.

[123]ibid.

[124] 'TheClimateChange_Amendment_Act_No.9of2023.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/2023/TheClimateChange_Amendment_Act_No.9of2023.pdf> accessed 27 November 2023.

[125] 'ClimateChangeActNo11of2016.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/ClimateChangeActNo11of2016.pdf> accessed 27 November 2023.

Agreement. The act makes provisions for more effective solutions for tackling climate change issues and promoting sustainable behaviors.

Fryd. O and others analyzed the role of urban green space and trees in relation to climate change and state that cities are highly susceptible to the effects of climate change. To mitigate these challenges, urban green spaces play a key role by moderating temperatures and managing stormwater. Thus, it is crucial to adapt our approaches to planting and caring for urban greenery to effectively tackle climate change. While the multitude of benefits that urban green spaces bring, including environmental, social, and economic advantages, is well-documented, there is still limited understanding of how to strategically plan and design green areas in specific locations to address climate change concerns.[126] De Abreu Hugo et al. study on Climate Change Impacts on the Road Transport Infrastructure,[127] highlights that Road transport plays a crucial role in the face of climate change, however, its impact is two-fold. On one hand, it significantly contributes to the increase in greenhouse gas emissions, aggravating the effects of global warming. Combustion of fossil fuels, such as gasoline and diesel, releases harmful pollutants like carbon dioxide into the atmosphere. On the other hand, road transport is also highly vulnerable to the consequences of climate change. This underlines the importance of implementing holistic and long-term methods to both mitigate the harmful impact of road transport on the climate and adapt to the ever-changing environmental conditions.[128]

The 2016 Act and the National Climate Change Action Plan (NCCAP) specify direction for low-carbon and climate resilient development. Other key instruments in the act include but are not limited to adaptation, afforestation and reforestation, landscape restoration, energy efficiency, and drought and flood risk management. In the *Greenbelt Movement & 4 Others v National Environmental Management Authority & Another; Kenya National Highways Authority (Interested Party) case,*[129] the Tribunal determined that the Nairobi expressway undertaking had obeyed EMCA, and the EIA Regulations, but had failed to execute a climate

[126] O Fryd, S Pauleit and O Bühler, 'The Role of Urban Green Space and Trees in Relation to Climate Change.' (2012) 2011 CABI Reviews 1 <https://www.cabidigitallibrary.org/doi/abs/10.1079/PAVSNNR20116053> accessed 27 November 2023.

[127] Victor Hugo Souza de Abreu, Andrea Souza Santos and Thaís Guedes Máximo Monteiro, 'Climate Change Impacts on the Road Transport Infrastructure: A Systematic Review on Adaptation Measures' (2022) 14 Sustainability 8864 <https://www.mdpi.com/2071-1050/14/14/8864> accessed 27 November 2023.

[128] ibid.

[129] 'Tribunal Appeal Net 19 of 2020 - Kenya Law' <http://kenyalaw.org/caselaw/cases/view/209345/> accessed 30 September 2023.

change analysis. Nevertheless, the EIA permit was not withdrawn, and the Court issued orders under section 129(3)© of the Environmental Management and Coordination Act (EMCA) to ensure the conservation of the environment and the promotion of sustainable development. The respondent was mandated to ensure conformity with climate change act 2016. [130] The Tribunal's verdict brought the gravity of climate change into focus, by emphasizing the need for greenhouse gas emissions to be analyzed due to motor vehicles playing a substantial role in this effect. It made note of how the Environmental and Social Impact Assessment (ESIA) report had outlined the various climatic zones influenced by the Expressway but had yet to examine the repercussions of the greenhouse gas emissions. As a result, the Tribunal decreed that the China Road and Bridge Corporation was to execute and finish a climate change analysis for the project, within 18 months from the date of their judgement. The Tribunal concluded that "We find that climate change analysis was necessary prior to the issuance of the EIA License." [131] With this ruling, the National Environmental Tribunal (NET) instructed the China Road and Bridge Corporation to diligently complete a comprehensive climate change analysis for their project within 18 months. This groundbreaking decision places a strong emphasis on the importance of climate change analysis. According to the Climate Change Act 2016,[132] climate change is defined as "*a change in the climate system which is caused by significant changes in the concentration of greenhouse gases as a consequence of human activities and which is in addition to natural climate change that has been observed during a considerable period*." Furthermore, Section 20 of the Climate Change Act provides that, "*The Authority shall integrate climate risk and vulnerability assessment into all forms of assessment and for that purpose liaise with relevant lead agencies for their technical advice*. "

2.4.4 Physical and Land Use Planning Act, 2019

The Physical and Land Use Planning Act of 2019, [133] repeals physical planning act 1996.This act serves as the primary legislation governing planning, regulation, utilization, and land

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[130] 'ClimateChangeActNo11of2016.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/ClimateChangeActNo11of2016.pdf> accessed 30 September 2023.

[131] 'Tribunal Appeal Net 19 of 2020 - Kenya Law'. <http://kenyalaw.org/caselaw/cases/view/209345/> accessed 30 September 2023.

[132] 'ClimateChangeActNo11of2016.Pdf' (n 200).

[133] 'PhysicalandLandUsePlanningAct_No13of2019.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/2019/PhysicalandLandUsePlanningAct_No13of2019.pdf > accessed 18 September 2023.

developments. Green spaces existence and protection has historically been linked to planning. Planning not only ensures that designated areas are safeguarded as green spaces but also resolves different uses in society. In the Act, [134] "public purposes" are clearly defined as encompassing vital community spaces such as public parks, playgrounds, gardens, and sports facilities. These crucial amenities are intricately tied to the formulation and execution of various planning documents, including the National Physical and Land Use Development Plan, Inter-County Physical and Land Use Development Plans, County Physical and Land Use Development Plans, Local Physical and Land Use Development Plans, as well as Special Area Plans and Renewal and Re-Development Plans. To ensure optimal land use, protect & conserve the environment, development control and enforcement mechanisms are rigorously implemented. Moreover, the County Government Act of 2012, [135] in Kenya bestows upon County Governments the authority to allocate and maintain these essential green spaces. The act covers, among other things, the green spaces and the infrastructure expected to be developed in the urban centers. In the act acquiring development approvals is a pre-requisite prior to undertaking any development, hence ensuring that green spaces and ecosystem services are protected. This planning is meant to reduce the interference of the green spaces from the future infrastructural development projects.

2.4.5 Land Act, 2012

The Land act 2012 was enacted with a purpose of giving effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws and to provide for sustainable administration and management of land and land-based resources. Substantive legislation on land matters in respect to issues of land tenure, creation of rights to land, transfer of land rights. Section 11, the National Land Commission is tasked to take appropriate action to maintain public land that has endangered or endemic species. Section 19 provides for enactment of rules and regulations for sustainable conservation of land based natural resources and measures to protect critical ecosystems and habitats. [136] The National Land Commission (NLC) must jealously guard green spaces. While illegal and irregular allocations of public land pose a great threat to the existence

[134] ibid.

[135] 'CountyGovernmentsAct_No17of2012_1.Pdf' <http://www.parliament.go.ke/sites/default/files/2017-05/CountyGovernmentsAct_No17of2012_1.pdf> accessed 18 September 2023.

[136] 'LandAct2012.Pdf' <http://www.parliament.go.ke/sites/default/files/2017-05/LandAct2012.pdf> accessed 18 September 2023.

of green spaces, the processes involved in the conversion of public land from one use to another also pose a significant threat to these spaces. Therefore, it is critical that the bodies occupying public land are held accountable by the NLC to protect the public interest in green spaces and open spaces.[137]

The most important provisions relating to green spaces include, Section 111(1) of the Land act 2012 states that compulsory acquisition of land may be done after the commission certifies that it's for public purpose or public interest in relation to necessary fulfilment of the stated public purpose. [138] The Land act 2012 and the 2010 constitution have an underlying disconnect, whereby the constitution plainly states, 'a public purpose' while the Land act states, 'stated public purpose'. In this situation the constitution being the supreme law takes precedence over the Land act. There is an apparent weakness to how the legislation was drafted. Art. 40 of 2010 constitution clearly stipulated the conditions to meet before Eminent Domain is realized[139], these conditions state that compulsory acquisition of community or private land must be in accordance with any act of parliament in his case the Land act 2012 provisions must be considered; be for a public purpose or public interest, the reason for acquisition must be obvious in the acquisition notice; Not acquired on flimsy grounds, the terms should be legal; and prompt payment in full and just compensation should be done prior to acquisition of the land.[140] Land act defines public purpose as " means purpose of - transportation including roads, canals, highways, railways, bridges, wharves and airports; - public parks, playgrounds, gardens, sports facilities and cemeteries."[141] Hence when wither county government or the national government require land for a public purpose such as green spaces the NLC can compulsorily acquire the land through eminent domain provisions. [142]

2.4.6 The Kenya Roads Act, 2007 (revised in 2012)

[137] 'Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in the Wake of Mega-Infrastructural Projects Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019'.

[138] Land act 2012 section 111

[139] 'Kenya Law: The Constitution of Kenya' <http://kenyalaw.org/kl/index.php?id=398> accessed 26 September 2023.

[140] 'LandAct2012.Pdf' (n 211).

[141] ibid.

[142] ibid.

Kenya Roads Act, 2007 [143], provides for the establishment of the KeNHA, the Kenya Urban Roads Authority (KURA) and the Kenya Rural Roads Authority (KeRRA), and provides for the powers and functions of the authorities and for connected purposes. Section 4 of this Act specifies the function of KeNHA, specifically; Section 4(1) states that "The Highways Authority shall be responsible for the management, development, rehabilitation and maintenance of national roads." Section 29 of this Act further indicates that in exercising the powers, an Authority shall do as little damage as possible, and, where any person suffers damage, no action or suit shall lie against the Authority, but he shall be entitled to such compensation thereof as may be agreed between him and the concerned Authority, or, in default of agreement, as may be determined by an arbitrator appointed by the Chief Justice. [144] The pivotal role of highway transportation in promoting economic expansion, alleviating poverty, and augmenting affluence in Kenya is indisputable. Nonetheless, the governance of the highway sector has traditionally confronted complications, including inadequate maintainace. Fortunately, recent efforts have been initiated to address the poor state of road infrastructure. This prompted the nomination of the Kenya Roads Board (KRB) by way of passing the Kenya Roads Board Act of 1999. Moreover, the reforms paved the way for the origin of three autonomous executing agencies: the Kenya National Highways Authority (KeNHA), the Kenya Urban Roads Authority (KURA), and the Kenya Rural Roads Authority (KeRRA). These agencies were formed in accordance with the Kenya Roads Act which came into force in 2007, with the intention of tackling the legal and organizational hindrances fundamental to road management and conservation. Section 4.2 of the ESIA Nairobi expressway project report indicates KeNHA Environmental Division is the overall authority for implementing environmental and social commitments of Nairobi expressway project.[145]

Even though there exist legal and regulatory frameworks that serve to protect natural ecosystems, questions continue to be raised over the robustness of these frameworks and their effectiveness in protecting natural ecosystems in the wake of major industrial developments.

[143] 'KenyaRoadsAct_No2of2007.Pdf' <http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/KenyaRoadsAct_No2of2007.pdf> accessed 18 September 2023.

[144] ibid.

[145] 'EIA_1688_Vol-I-II_EIA-Study-Report-For-the-Proposed-Nairobi-Expressway-Project.Pdf' (n 194).

According to Barczewski[146], in an examination of the effectiveness of the environmental regulations in Kenya through a case study of the Thika Superhighway Improvement Project, he reports that Kenya has an existing legal framework that protects environmental concerns during major infrastructural developments. Citing the Environmental Management and Coordination Act of 1999[147] (EMCA 1999), which lays out EIA guidelines to be used in assessing the impacts of development on the environment, he states that some of these guidelines lack particularities that cause difficulties in implementation. [148] Despite the already existing institutional framework, it is imperative to conduct in-depth examination and provide clarity on legislative gaps, institutional overlaps and duties and responsibilities thus making the study relevant. Based on the legislation review completed it can be concluded that Kenya has numerous laws governing various aspects of the environment but there is no unified legislative or policy directives regarding the meaning, generation, utilization, and preservation of green spaces and their ecosystem services. To start with, these regulations are spread out across a range of regulations related to land, environment, planning, forestry, and wildlife, making them less potent, due to legislative gaps, institutional clashes and overlaps, and policy incoherences.[149]In addition, the abundance of authorities charged with taking care of such spaces can spark confrontations and hinder unified governance. Furthermore, the legislation in force often do not have in-depth rules, with some only addressing the construction or handling of these places as forests or arboretums or forests, instead of primarily as green spaces. [150] Despite its importance to both the future and present generation, Uhuru Park suffers from an absence of significant legislation and policy protection. Kenyan rules and regulations recognize the significance of green spaces, but they don't include precise protective measures for preserving their special characteristics. To tackle this issue, green spaces like Uhuru Park should be labeled resources subject to the Public Trust Doctrine (PTD), and legislative arrangements should be formulated to give this doctrine authentic authority in authorization activities. [151] Moreover, Uhuru Park lacks a reliable organizational and management system,

[146] Benjamin Barczewski: How Well do Environmental Regulations Work in Kenya? A Case study of the Thika Superhighway Improvement Project (2023)

[147] 'EnvironmentalManagementandCo-ordinationAct_No8of1999.Pdf'.

[148] Ibid Benjamin Barczewski: (n 145)

[149] Odote (n 48).

[150] ibid.

[151] ibid.

coupled with insufficient allocation of resources for its preservation. Green spaces areas necessitate timely preservation to stay habitable and desirable; yet, numerous are in poor condition and highly vulnerable to encroachment and being converted to other land uses. To halt Uhuru Park from experiencing such difficulties, the Nairobi County Government needs to apportion resources under its county preparation and public facilities division, which involves the efficient upkeep of County Parks. Unfortunately, this detail is presently not adequately considered in the Nairobi County Government's annual budgetary procedures. [152] Finally, the future brings with it the duty to respect Isabella Holmes's ideas from long ago with respect to green spaces in highly inhabited centers. It is indispensable to guarantee and guard these green spaces to bolster recreation and well-being among the public, particularly as cities expand and the demand for efficient urban planning increases. Offering green spaces ought no longer to be elective but instead necessary, remedying a long-standing lack in preserving these invaluable assets. [153]

2.5 Options for Securing Green Spaces from Infrastructural developments.

Sustainable development (SD) is a dream for most modern cities, in literature SD usually incorporates social, economic, and environmental factors. These three dimensions must be balanced for sustainable development to be realized.[154] E. Juaneé, study highlights the unequal prioritization of development and environmental approaches in urban areas, arguing that holistic planning is crucial for urban sustainability. However, environmental considerations are often neglected or sacrificed due to land-use planning decisions and local authorities' perceptions, that UGS have little to no economic value.[155] Concerns over the loss of green areas around the world have prompted a reassessment of their value from the perspectives of environmental (green) and urban economics. It is thought that assigning a monetary value to green spaces is a tactic used to get authorities to understand and value them. This strategy is based on the idea that valuing green spaces economically can affect land-use decisions, which are a crucial tool for economic growth. [156] J.Choumert and J.Salanié, supports this argument by stating that to ensure the effectiveness of government expenditure, UGS provision should

[152] ibid.

[153] ibid.

[154] Elizelle Juaneé Cilliers, 'Rethinking Sustainable Development : The Economic Value of Green Spaces' (Thesis, North-West University 2010) <https://repository.nwu.ac.za/handle/10394/4567> accessed 4 December 2023.

[155] ibid.

[156] ibid.

be based on economic principles.[157] Vandermeulen et al,[158] highlights that in order to educate policymakers about the benefits of incorporating green functions into development and planning processes, it is required to analyse the numerous functions of green spaces in an accurate, intelligible, and readily reproducible manner. Following this evaluation, convincing arguments will be developed to illustrate the added value of green space, not only to the directly affected stakeholders, but also to the regional economy as a whole. A study by H.Zou and X.Wang highlights that Urban green space management is a complex issue that requires a balance between bottom-up strategies and top-down approaches. Bottom-up strategies aim to protect social and ecological sustainability, while top-down approaches focus on maintaining urban greening.[159]

The Ecosystem Services Approach gives land-use planners a chance to create metropolitan areas that are environmentally sustainable.[160] The concept of ES is the pathway to provide nature goods and services to the society.[161] Zari,[162] on analysing use f biodiversity as an ESA stresses that Ecosystem services analysis (ESA) is a way to quantify ecosystem service provision in metropolitan settings, aiming to reduce negative ecological impacts by designing cities that integrate with or support ecosystem services. ESA provides measurable ecological benchmarks, enabling long-term spatial planning and decision-making. By integrating built environments with other species' habitats, ESA can lead to more adaptable and beneficial built environments, reducing pressure on local and distant ecosystems and biodiversity.[163] The use of the ES framework stresses the significance of nature to various stakeholders, assisting in the

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[157] Johanna Choumert and Julien Salanié, 'Provision of Urban Green Spaces: Some Insights from Economics' (2008) 33 Landscape Research 331 <https://doi.org/10.1080/01426390802045996> accessed 4 December 2023.

[158] Valerie Vandermeulen and others, 'The Use of Economic Valuation to Create Public Support for Green Infrastructure Investments in Urban Areas' (2011) 103 Landscape and Urban Planning 198 <https://www.sciencedirect.com/science/article/pii/S0169204611002428> accessed 4 December 2023.

[159] Hao Zou and Xiaojun Wang, 'Progress and Gaps in Research on Urban Green Space Morphology: A Review' (2021) 13 Sustainability 1202 <https://www.mdpi.com/2071-1050/13/3/1202> accessed 3 December 2023.

[160] Jari Niemelä and others, 'Using the Ecosystem Services Approach for Better Planning and Conservation of Urban Green Spaces: A Finland Case Study' (2010) 19 Biodiversity and Conservation 3225 <https://doi.org/10.1007/s10531-010-9888-8> accessed 4 December 2023.

[161] Christiaan Hummel and others, 'Protected Area Management: Fusion and Confusion with the Ecosystem Services Approach' (2019) 651 Science of The Total Environment 2432 <https://www.sciencedirect.com/science/article/pii/S0048969718339068> accessed 4 December 2023.

[162] Maibritt Pedersen Zari, 'The Importance of Urban Biodiversity – an Ecosystem Services Approach' (2018) 2 Biodiversity International Journal 357 <https://medcraveonline.com/BIJ/the-importance-of-urban-biodiversity-ndash-an-ecosystem-services-approach.html> accessed 4 December 2023.

[163] ibid.

management and protection of UGS. The ES concept emphasizes the importance of ecosystems for biodiversity, ecological balance, and human well-being. It highlights the tangible and intangible services provided by ecosystems, such as provisioning, regulating, supporting, and providing cultural benefits. Recognizing and measuring ecosystem services in Protected Areas can improve management tactics and justify conservation measures. The ES idea can influence decision-makers to prioritize the protection and sustainable use of natural areas, linking conservation efforts with broader human well-being and sustainable development goals.[164]

Environmental justice is another strategy that has been suggested for protecting green areas. According to Adjei Mensah[165], this is a notion that broadly addresses equity in the allocation of environmental benefits and costs. This idea is helpful in developing nations because it shields the impoverished, who make up the majority in the area, from a variety of environmental issues and allows them to actively engage in the process of making decisions regarding environmental issues. Equity in the distribution of environmental issues and benefits is the main idea behind this concept. This was succinctly expressed by McLaran[166] who said that the idea behind environmental justice is to shield all kinds of people from suffering the negative effects of a damaged or unhealthy environment and that benefits to the environment should be shared fairly among all social groups. Stephen[167] defines equity in this context as the idea that all individuals and groups have a right to live in a clean and healthy environment as well as an equal protection from environmental threats. Agyeman and Evans[168]claim that environmental justice has both procedural and substantive components, based on equity. While the substantive facet is focused on the right to live in and enjoy a clean and healthy environment, the procedural part deals with the meaningful engagement of all people in environmental decision-making. According to this interpretation, the idea is both proactive in achieving and distributing environmental advantages as well as reactive in responding to environmental threats. The idea of sustainable development serves as a solid foundation for the equity debate.

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[164] Hummel and others (n 238).

[165] Tzoulas, Konstantinos, Kalevi Korpela, Stephen Venn, Vesa Yli-Pelkonen, Aleksandra Kaźmierczak, Jari Niemela, and Philip James. "Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review." Landscape and urban planning 81, no. 3 [2007]: 167-178.

[166] McLaren (n 140)

[167] Stephens, C. 'Environmental justice: A critical issue for all environmental scientists everywhere.' Environmental Research Letters, [2007]2(4): 2.

[168] Agyeman, J., Bullard, R. D., & Evans, B. 'Exploring the nexus: Bringing together sustainability, environmental justice and equity.' Space and Polity, [2006] 6(1): 77-90.

According to Warner[169] environmental justice issues are deeply ingrained in sustainable development. The relationship between green spaces and environmental justice is based on equity, as the creation of green spaces contributes to the equitable access to natural vegetation, which is a significant component of the natural environment and includes parks, gardens, forests, woodlands, and other green vegetation. Davis et al[170] also argue that equitable distribution of green spaces within communities improves environmental justice because it allows everyone to fairly access natural vegetation and take advantage of the attributes of the environment.

2.6 Research Gaps

The studies examined revealed various dimensions and perspectives on infrastructure development and how it affects green space and its ecosystem services. From the various literature examined above, the studies examined revealed various dimensions and perspectives on infrastructure development and how it affects green space utilization and ecosystem services. From the studies, various gaps can be identified which justify the need for the current study. For instance, previous studies on Impact of infrastructure developments on green spaces and their ability to provide ecosystem services in Kenya have focused on diverse types of projects. Nyumba, Sang and others[171] conducted a qualitative examination of the impact of the standard gauge railway Construction in Kenya and they established that its construction has caused environmental degradation, ecosystem fragmentation and ecosystem destruction. Similarly, Mercy Lagat studied UGS physical encroachment in Kenya and concluded that physical expansion caused the loss of UGS in Kisumu and Eldoret[172] while Ouko et al. centered their research on the perceptions of residents of the ES supplied by forest and how they engage in their management. From this literature no study has examined the impact of the Nairobi

[169] Warner, J. F. 'More sustainable participation? Multi-stakeholder platforms for integrated catchment management. Water Resources Development [2006]. 22 (1): 15–35.

[170] Davis, A. Y., Belaire, J. A., Farfan, M. A., Milz, D., Sweeney, E. R., Loss, S. R., & Minor, E. S. 'Green infrastructure and bird diversity across an urban socioeconomic gradient.' Ecosphere, [2012] 3(11): 1–18

[171] Nyumba TO, Sang CC, Olago DO, Marchant R, Waruingi L, Githiora Y, et al: "Assessing the ecological impacts of transportation infrastructure development: A reconnaissance study of the Standard Gauge Railway in Kenya." *PLoS ONE* 16(1) (2021).

[172] Mercy Jeptum Lagat, 'URBAN GREEN SPACES STATUS AND CHANGES OVER TIME: THE CASE OF KISUMU AND ELDORET TOWNS.' (Thesis, University of Eldoret 2021) <http://41.89.164.27:8080/xmlui/handle/123456789/1042> accessed 29 September 2022.

Expressway particularly on the operational phase of the project. This study therefore fills this gap by addressing impacts of the project on green spaces in the current operational phase.

The second gap this study intends to fill is the methodological approach used by the researcher in answering the research questions posed by the study. The study adopted a multiple stakeholder view based qualitative research design in which users of ecosystems were the primary source of data which was complemented by secondary data from reports, journal articles and legal documents. This approach differs from other studies as it has integrated the legal framework for environmental regulation and management critically examining the gaps in law that need to be addressed to effectively guard green spaces and their ability to provide ecosystem services. This study therefore intends to fill the existing gap in literature on legal and regulatory weaknesses that if filled will be instrumental in effectively guarding green spaces in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Study Context

The Nairobi Expressway is an access controlled dual carriageway to run along the central reserve of the that runs from Mlolongo in Machakos County to James Gichuru Road in Westlands, Nairobi County. It is A four-lane dual carriageway whose total length of the Project is approximately 27Km, including 15.7Km at grade and 11Km elevated with 10 Interchanges/Entry or Exists/Toll Plazas. The Nairobi Expressway passes through Kenya's largest and main Airport, the Jomo Kenyatta International Airport.[1] This project was developed in Public Private Partnership model (PPP) with 30-year concession period, including 3-year construction period and 27-year operation period. The construction of the road infrastructure began in 2019 and ended in 2022 with the main contractor being the China Road and Bridge Corporation (CRBC) and a contracted sum of KES 72 billion (US$668 Million) The Project was expected to ease traffic congestion along Mombasa Road, reduce the commute to and from Mlolongo Area to Westlands from approximately 2hrs to 20 minutes.[2]

3.2 Research Design

The study was anchored on descriptive and explanatory research designs. As defined by Saunders (2019), a research design is the framework that guides the researcher on how to conduct a study, by specifying the type of data that is ideal for the study, the best instrument to use to obtain such data and the method of analysis appropriate for the data. A descriptive research design according to Richey and Klein, involves use of quantitative analysis and qualitative analysis methods to obtain and analyze data.[3] An explanatory research design on the other hand involves the explanation of the phenomenon based on the established facts and factors from literature review, focus group discussions and in-depth interviews.[4] An explanatory research design helps the research to establish the underlying facts using what is already known and joins the dots to make more informed conclusions and recommendations.

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[1] Construct Africa. 'Nairobi Expressway, Kenya.' (Construct Africa, 2019) available at https://www.constructafrica.com/album-gallery/nairobi-expressway-kenya accessed on 11th November 2023

[2] Ibid

[3] Richey, R. C., & Klein, J. D. (2014). *Design and development research: Methods, strategies, and issues*. Routledge

[4] Bryman, A. (2016). *Social research methods*. Oxford university press

Using both descriptive and explanatory research approaches enabled the study to extensively determine the legal challenges of infrastructural developments on green spaces in Kenya.

3.3 Data Needs, Type and Sources

The study required data on the impacts of transport infrastructure development on the supply of ES within UGS. The major ES provided by green spaces, as well as the extent to which the current Nairobi expressway has impacted Uhuru Park's provision of ecosystem services. These statistics will come from primary and secondary sources. The secondary data sources involved an appraisal of previous research works on the perception and ideologies of public open spaces/public parks and infrastructure development, Nairobi City County, and documentations on public green spaces in the city using Uhuru Park as a case study. The primary data was gathered from Uhuru Park visitors. According to the Nairobi City County, Uhuru Park receives an average of 5500 visitors per day. The Park also has over 400 small-scale traders who sell consumer goods. The study will focus on both traders and visitors. The research will also focus on the two major Nairobi City County departments in charge of infrastructure and green spaces. The departments are Housing, Lands, Urban Planning, project management and Urban Renewal, as well as Environment, Energy, Water, and Sanitation.

Table 3.1: Data Needs, Type and Sources

Research Need	Data Type	Data Sources
To determine the impact of infrastructure development on green spaces	Primary and Secondary	**Primary** • Questionnaire administered. **Secondary** • Existing Reports • Infrastructure development Case studies • Litigation publications
To determine the extent of the existing legal and institutional framework in safeguarding urban green spaces	Primary and Secondary	**Primary** • Key informant interviews **Secondary** • Existing Reports • Infrastructure development Case studies • Litigation publications
To determine the options for securing urban green spaces in the face of infrastructure development	Primary and Secondary	**Primary** • Questionnaire administered. • Key informant interviews • **Secondary** • Existing Reports

		• Infrastructure development Case studies • Litigation publications

3.4 Sampling and Sample Size Determination

According to Greenfield and Greener (2016), sampling is the process of obtaining an appropriate number of respondents from the target population that best represents the population of the study and allows the research to obtain adequate information for deriving conclusion and recommendations. This study focused on Park users comprising of visitors and the small-scale traders. Additionally, ten key informants (representative from NEMA, Nairobi city county, KeNHA, (VSO Kenya) voluntary service oversees, Green belt movement) were sampled.

A simple random sampling was used to obtain the users of green spaces (visitors and small-scale traders). According to Taherdoost, in a scenario where the researcher is not aware of the existing characteristics of the respondents such as educational level, and level of experience or awareness to the subject matter of the study, the research may pick a respondent randomly, then seeks clarification on whether the respondent is ware of the subject matter and if they are aware, the interview or survey is conducted.[5] This sampling methodology was selected because of its simplicity and lack of bias in choosing respondents for the study. Once a randomly selected respondent was not aware or not willing to take part in the study, a different respondent was chosen. The sample size for the key informant interviews was obtained through purposive sampling. The study adopted Yamane formula for a finite population. The study targeted a population size of 5500 respondents. The sample size was given by:

$$n = N / \{1 + (N e^2)\}$$

Where: n = Number of samples

N = Total population

e = Tolerance level (error at 95% confidence level)

[5] Taherdoost, H. (2016). Sampling methods in research methodology; how to choose a sampling technique for research

Where N (**5500**) is the population size, e (0.10) as the tolerance level, the sample size n was computed as;

$$n = 5500 / \{1 + (5500 * 0.1^{2})\}$$

$$n = 5500 / \{1 + (5500 * 0.01)\}$$

$$n = 5500 / \{56\}$$

$$n = 98$$

Additionally, key experts in environmental law who have taken part in cases pertaining Uhuru Park, NEMA representatives, Nairobi city county officials, Environmental activists from green belt movement and officials from the Kenya national Highways authority. A total of ten Key informants were selected for the study using the purposive sampling methodology. A purposive sampling methodology was selected as the researcher sought information from select individuals with expert knowledge in environmental and infrastructural development in urban areas who could provide firsthand knowledge on the development and impacts of the Nairobi Expressway.

3.5 Data Collection

Data collection is the process of gathering the necessary information for the study that will be used to answer the questions submitted by the respondents.[6] This process involved conducting a survey and holding in depth interviews with key stakeholders in the environment sector. Secondary data collection was conducted through the review of published documents related to the ecosystem services that green spaces provide. The data collected was used to identify the impacts of infrastructure development on green spaces in Kenya. It would also help develop strategies to improve the governance and policing of green spaces.

3.5.1 Questionnaire

Park visitors who were randomly chosen were given a questionnaire. There were two types of questions in the survey: open and closed-ended. To ensure that the respondents could respond on a more forgiving basis, the questions were conducted using a 5-point Likert scale. An online

[6] Elfil, M., & Negida, A. (2017). Sampling methods in clinical research; an educational review.

version of the survey was also created to accommodate the individuals who visited the park for a brief time.

3.5.2 Interview of key informant

Key informant interviews are explanatory and interpretative rather than descriptive, and they are conducted with a small group of people. It examines motives, perceptions, beliefs, and attitudes and deals with less tangible and measurable topics. In this study, key informant interviews were conducted with key agencies involved in infrastructure development and green space protection. The main topics that were covered included the government's role in protecting green spaces in urban areas, the ecosystem services sought in green spaces, the threat posed by infrastructure development to green spaces, and future mitigation strategies. According to the research permits, key informant interviewees were consulted, briefed on the research, and asked for their consent.

3.5.3 Interview Schedule

An interview schedule was used to collect data from the key informants selected for the study. The two key informants were consulted, and appointments sought for the interview. The interview schedule was structured such that there were formulated interview questions which were shared with the interviewees. The purpose and need for the study were informed to each of the interviewees to ensure their consent and preparedness prior to the interview date.

3.6 Data Analysis

Both qualitative and quantitative data analysis methods were used to examine the study's data. The analysis of the qualitative information gathered through interviews was done using thematic analysis in which findings were presented based on the emergent themes. The study presented key insights based on themes from the key informant interviews. On the other hand, quantitative techniques were used to analyze the bio data from the respondents that was gathered quantitatively through questionnaires.

3.7 Limitations of the Study

The study adopted descriptive and explanatory research designs in population and sample determination and data collection. The limitations of an explanatory research design is that while it may help solidify a theory, it usually lacks conclusive results which is a similar limitation with the descriptive research design. Additionally, they may both lack a standardized

analysis method and may be limited in scope and, hence creating biased results. This limitation was overcome through the selection of multiple data sources.

3.8 Ethical Considerations

Respondents were required to provide informed consent. They were informed of the study's purpose and that their participation was entirely voluntary. Respondents were also assured of their privacy, as they were asked not to provide any personal information or information that would reveal their identity. As proof of authorization to conduct the study, a research permit was obtained and attached to the questionnaire. Nairobi County's permission was also be sought through the department of research and innovation.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Overview

The objective of this study was to address the legal challenges of infrastructure developments on green spaces with a focus on the Nairobi Expressway. Data was collected from park visitors and traders using both open and closed-ended questionnaires that were rated using a Likert scale. Data was also obtained from ten Key informant interviews with key stakeholders involved in infrastructure development and green space protection. Data analysis was subsequently done, and the results are presented in this chapter.

4.2 Response Rate

The response rate is determined through a comparison of the number of completed questionnaire responses against the sample size selected by the researcher in a study. This rate is also called the completion rate or return rate and is normally given in the form percentages. Table 4.1 illustrates the completion rate for the study.

Table 4.1: Response Rate

Response Rate	Frequency	Percent
Completed	92	93.8
Incomplete	6	6.2
Total	**98**	**100**

From Table 4.1, 98 questionnaires were handed out both physically and through google forms to park visitors and traders located at Uhuru Park. From the findings, it was established that 92 of the 98 questionnaires issued were correctly filled and returned, translating to a 93.8 percent response rate. These findings agree with Kothari (2016). who mentioned that a 70% response in a study is acceptable for data analysis purposes. The responses gathered for the study were hence adequate to respond to the research objectives of the study.

4.4 Research findings

The section below presents the findings for each variable considered in the study of the findings. The quantitative and qualitative findings for each objective of the study will be presented in this section.

4.4.1 Stakeholder's Perceptions on the impact Nairobi expressway development on green spaces

The first objective of the study was to determine stakeholder perceptions regarding infrastructure development on green spaces with the focus being the Nairobi Expressway. From the responses, users of the green spaces concurred that the Nairobi Expressway has had a significant impact on the different green spaces in Nairobi County. Participants agreed that the most notable impact was the lack of clean air and shade resulting from destruction of indigenous species of trees and vegetation which were uprooted to pave way for the construction of the multi-lane dual carriage that have yet to be replaced. Even after its completion, greening efforts have not been witnessed to restore the lost vegetation. However, however recognized beautification attempts around the Nairobi Expressway.

The sentiments of the participants were confirmed by those of the National Environmental Management Authority (NEMA) representatives based in Nairobi County. According to them *"Many indigenous tree species and bird habitats were destroyed to pave way for the construction of the Expressway, which are yet to be replaced through a tree planting exercise that was to be done by the contractor."* According to them, tree planting initiatives are usually required in the wake of major infrastructural developments to avoid the collision of green spaces and infrastructural developments. Representatives from the Kenya National Highways authority agreed with their sentiments stating that "*The Contractor was supposed to plant approximately five trees for every one tree felled during the exercise to replace lost vegetation*." They however confirmed the existence of greening exercises conducted by KeNHA along the Nairobi Expressway to prevent soil erosion and replace the lost vegetation. A review of a Nairobi Expressway Audit report released in January 2023 from a joint initiative by the UN HABITAT, Nairobi County government ITDP and KeNHA[1] confirmed that at least 2500 trees were lost during the construction of the Expressway and are yet to be replaced by the Nairobi Expressway Contractor.

[1] Institute for Transportation and Development policy. 'Nairobi Expressway Audit.'(IDTP, Jan 2023) Available at https://africa.itdp.org/publication/nairobi-expressway-audit/ accessed 11th November 2023

Similar sentiments were shared by the key representative from the Green Belt movement who emphasized the need to maintain green spaces in the city for ensuring future survival of mankind. Even though they acknowledged that the infrastructure did not touch the park, it sets a bad precedent since in future generations, green spaces will be critical to humankind's survival. From her assessment of the Nairobi Expressway construction, which was done near green spaces like Uhuru Park, the Nairobi arboretum and the Nairobi National Park, A key representative from the organization noted that *"the road contractors should adopt mitigation measures to compensate for the loss of vegetation by planting trees along these green spaces to compensate for the loss of vegetation and trees*."

Quoting the environmental and social impact assessment of the proposed expressway, which was conducted in 2020, the NEMA representative recognized that the minimal impact on Uhuru Park by the project was because of the environmental considerations taken during the project proposal stage that formed the legal framework under which the project was done. However, he argued that a new threat has emerged following a public notice published by the KeNHA and the Moja Expressway Company dated 5th June 2023[2]seeking public opinion for Nairobi Expressway toll optimization and upgrading project which will involve the construction of new Expressway exit lanes at Uhuru Park and Museum Hill at the Central business district which was subsequently approved by the current Governor of Nairobi.

The study participants noted that with the construction of the Nairobi Expressway, there has been an increased risk of physical encroachment of green spaces within the city including the natural habitats for birds and wild animals. An example was given of the expressway passing near the Nairobi national park and the Nairobi arboretum. According to the participants, the location of the expressway close to these green spaces places them under the threat of physical encroachment that may result in ecosystem fragmentation. According to them, the Nairobi Expressway is located close to the Nairobi National Park that may create a barrier to the free movement of wild animals within the park and reduce the size of the park. Participants raised concerns that "*the Nairobi Expressway has the potential to affect movement of wildlife thus increasing human-animal conflict.*"

[2] The Nairobi Expressway,' Proposed Nairobi Expressway Toll Optimization and Upgrading Project Stakeholder and Public Consultation Forums, (Nairobi Expressway, June 2023) Available at https://www.nairobiexpressway.ke/download-pdf/36 accessed 11th November 2023

Their sentiments were supported by the Key legal informant on environmental matters in Nairobi who stated that as professionals in the climate sector, they should emphatically realize a balance between development and natural resource management citing the Nairobi National Park. He stated that *"Outlining the positives and negatives of proposed projects to existing green spaces and mitigation measures against these negatives are necessary in protection of green spaces. Infrastructural development should not be prioritized over the protection of natural resources such as wildlife."* He however noted that currently, apart from the urban areas and cities Act of 2011 which gives effect to physical planning to maintain green spaces for a functional ecosystem, there are no legal frameworks that prioritize infrastructural developments over conservation of green spaces but noted that there are continuous demands by the civil society to gazette specific areas as protected zones.

Another Key concern the study addressed was the impact of the Nairobi Expressway infrastructure on pollution particularly in Air, Noise, and water pollution. From the participants' views, it could not be established whether there was an increase or decrease in pollution because of the construction of the expressway. Even though many concurred that this was witnessed in the construction phase of the project, they felt no change in air quality in the current operational phase. It should be noted that Kenya's Environmental Management Regulations under the EMCA Air Quality Regulations 2014 provides guidelines for emissions standards applicable to a wide range of sources. A review of these regulations shows that it is a requirement for large projects such as infrastructural developments which have the potential to create emissions to undergo an Environmental impact Assessment. However, in the absence of air quality monitoring systems, measuring the levels of air pollutants is challenging and thus it cannot be determined if the level of pollutants is increasing or decreasing. This was also highlighted by Key informants from NEMA, confirming the inability to measure the extent of pollution resulting from the infrastructural development.

Finally, a major stakeholder concern over the construction of the Nairobi Expressway noted by participants was the failure by the government to balance infrastructure and conservation. Citing the recent court cases and public outrage regarding the potential encroachment of green spaces in Nairobi, participants mentioned that that in recent times, green spaces such as parks and forests have been under threat. Most of the participants recalled the public outrage after the initial design of the Nairobi Expressway that was to pass through Uhuru Park as an example and the recent threat posed by the proposed new exists at Uhuru Park and the Museum Hill as

a potential threat Hill to green spaces. Because of this they felt that infrastructure development is still being prioritized over conservation hence posing an ongoing threat to these spaces. While defending the construction of the Nairobi Expressway, representatives from KeNHA defended its construction citing that it had met environmental requirements and a comprehensive Environmental Impact Assessment had been done prior to its construction as required by the Environmental Management and Co-ordination Act of Kenya (EMCA) 1999 which was subsequently amended in 2015 which mandates that all development projects conduct impact assessment on ongoing projects prior to developments. The sufficiency of the EIA was however challenged by conservationist groups who termed it as inadequate as it did not present well-formulated strategic environmental assessments[3]

4.4.2 Extent of the existing legal and institutional framework in safeguarding urban green spaces

The second objective was on the impact of the Nairobi Expressway impact on existing legal and institutional frameworks. A major observation from the participants was limited knowledge on existing legal and institutional frameworks targeting protection of green spaces and development of infrastructures in Kenya. Additionally, a moderate knowledge of existing litigations concerning the developments around green spaces was observed. This was established from the participant's inability to cite relevant legislation and regulations that provide protection to green spaces and their rights such as the right to have a healthy environment as Articulated by The Constitution of Kenya 2010.

Key informants from conservation groups such as the Green Belt movement noted with concern that public education on environmental conservation laws and the rights of the public in regards to having access to healthy green spaces was very limited especially in urban areas which suffer the most significant threats to environmental and ecosystem degradation., reiterating the importance of awareness creation among members of the public on their rights to have green spaces and compelling them to participate in conversations surrounding green spaces. This was supported by key experts in Environmental law interviewed who argued that engaging the public increases ownership of development project decisions as public

[3] Natural Justice – NJ. (2020). Written Submissions on The Environmental and Social Impact Assessment (Esia) Study Report for The Proposed Nairobi Expressway Project.

engagement will generate discussions about green spaces, the value of these spaces in urban areas and generate measures to balance environmental, social, and economic considerations.

Contrary to the findings which showed limited public knowledge on environmental regulations, public outcries on intended encroachments to green spaces have been on the increase. Participants were able to recognize the importance of having these spaces and supported previous public protests and cases advocating for environmental protection. They however noted that these cases have not been effectively acted upon by the relevant authorities and environmental agencies in Kenya as required. Their confidence in the ability of bodies like NEMA to protect green spaces like Uhuru Park was low.

From his legal opinion, the Key informant on environmental law reiterated the importance of public participation in environmental matters. Quoting article 42 of the constitution of Kenya, which grants every Kenyan the right to a healthy environment and an obligation to safeguard it, he stated that the constitution underscores the importance of sustainable development aiming to strike a balance between development and conservation and that it is imperative for the public to continuously be aware of their right to a sustainable environment. A review of the constitution shows that it not only advocates for public participation on environmental protection, but it also establishes guidelines for environmental impact assessments, audits and monitoring. Furthermore, the constitution prohibits any activities or processes that put the environment into danger. The constitution lays the foundation for conservation but findings from the study showed a general lack of awareness of these requirements. This indicates that more public education on legal and institutional laws governing green spaces particularly in urban areas. He agrees that involvement from the public is necessary to strengthen existing voices that fight for environmental rights.

While defending infrastructure developments, officials from KeNHA reiterated the organization's commitment to environmental protection through the KeNHA Environment and Social Safeguards policy. A review of the KeNHA Environment and Social Safeguards policy adopted in 2019 outlines key strategies adopted by the state corporation to promote sustainable road development. In this policy, the body recognizes the importance of a healthy environment and the potential impacts that environmental challenges will pose if left unaddressed. The policy guideline was developed in 2019 to assist KeNHA comply with provisions of the EMCA Act of 1999. The policy guidelines also highlight strategies to be used by KeNHA to restore biodiversity in areas where impacts are unavoidable. However, the policy guidelines are mere

strategies implemented by KeNHA and are not legally binding nor are they backed by existing legislation. Furthermore, the reluctance by the body to compel the road contactors to reverse the damage to the environment that was witnessed during construction as reported by the Nairobi Expressway Audit is an indication that these policies were not followed following calls from conservationists to restore the city's biodiversity by planting trees which is yet to be completed even after the completion of construction of the major road infrastructure.

There are other laws and regulations in Kenya that play a role in conservation such as the Physical and Land use planning Act 2019 that serves as the key legislation that governs the planning, regulation, utilization and land developments. This legislation is crucial to the protection of green spaces in urban areas as it ensures that these designated areas are safeguarded as green space. The purpose of the act is to ensure optimal usage of land, to protect and conserve the environment. Apart from this, the County Government Act 2012 bestows the county government of Nairobi to maintain and allocate green spaces. Arguments by Key legal representatives regarding the enforcement of these laws governing green spaces indicated a general lack of enforcement and accountability by the County governments to enforce these regulations amidst major infrastructural developments. He stated that enforcement of environmental legislation should not only be left to the National Environmental Management Authority but should be a multiple-stakeholder initiative if proper land regulation enforcement is to be realized.

4.4.3 Options for Securing green spaces from infrastructure development.

The third objective was the opinion of the respondents on the best way to secure green spaces from infrastructural developments. According to the responses gathered, proper planning of infrastructural projects will significantly contribute to securing green spaces. Additionally, legal measures and involvement of the community are essential to securing green public spaces. Apart from these, more support should be given to environmental activists who aim to protect these spaces through lobbying for more stringent actions against those opposed to securing green spaces. Finally, the respondents support the stopping of infrastructural developments that interfere with green spaces. One of the key concerns over the existing laws governing the environment is their limited scope.

According to the representative from NEMA, the legislation in force today does not adequately protect the existing green spaces in urban area. The various gaps within the laws continue to

hamper efforts to conserve green spaces within the city. He argues that more legislative amendments are required to expand the scope of environmental protection to protect green spaces which have been neglected by existing laws.

Equally so, the representative from the Nairobi city county explained that the county government has been lax in ensuring efficient maintenance of city parks and green spaces and this is because of limited budget allocations to ensure the green spaces are protected and maintained on a constant basis. According to the key legal experts interviewed, strengthening the need to balance infrastructure development and conservation lies in strengthening legislation on protection of green spaces. He noted with concern the lack of recognition of conservation of ecosystems in the Kenya Roads Act 2007 the major act that established the organizations responsible for road Construction such as the Kenya National Highways Authority (KeNHA) and the Kenya Urban Roads Authority. He suggested that this legislation should be amended to include conservation matters as this will extend the scope of current legislation on conservation matters to key stakeholders in the development industry.

4.4.3.1 Contribution of Stakeholders in Guarding Green Spaces

The researcher was interested in determining the extent to which the respondents considered major stakeholders to be critical in the safeguarding of green spaces. From the responses, majority of participants mentioned that the national government, county governments, the county and national assembly (through legislation), Environmental activists the National Environmental Management Authority (NEMA) and the Kenyan public should all play an active role in safeguarding green spaces.

They, however, considered international bodies to be less active in this role. From the qualitative interviews with key informants, they suggested consultation and public participation in conversations regarding securing of green spaces is important but was quick to point out that public participation is hardly practiced in conservation matters as it is in infrastructural development projects. According to the NEMA representative, the civil society and other local public benefit organizations have been instrumental in advocating for the protection of green spaces. However, their efforts have been almost futile because of lack of political support. He cited John Michuki Park as an example of an initiative backed by political support which was successful.

4.5 Recommendations on what should be done to strike a balance between infrastructural development and protection of green spaces.

Most of the respondents cited legislation as the ultimate solution to balance infrastructural developments and protection of green spaces. Another recommendation was public engagement and consultation across all stakeholders to find viable solutions to the current debate concerning green spaces and infrastructural development. According to them infrastructural development is critical to economic growth. However, this should be done in a sustainable manner to protect the existing ecosystems. According to the legal representative, consultations and partnerships between the national and county governments have been witnessed on legislative efforts to strike a balance between infrastructural development and conservation efforts however, financing towards management of green spaces is severely lacking hence the efforts have been futile.

Recommendations from the key informants interviewed included more legislative amendments to close the current existing gaps in the existing legal and institutional frameworks. One legal concern was the gazettement of existing green spaces as protected spaces to avoid future interferences from third parties. Additionally, he emphasized the role of public participation in environmental activism stating that more public education on the rights of Kenyans particularly those living close to green spaces in the fight against environmental degradation. Other recommendations included constitutional amendments to existing laws to make them more sound by increasing their scope of application to existing green spaces, additional punitive measures to parties found guilty of environmental degradation and promotion of environmental activism through funding of existing bodies involved in environmental protection.

For the majority of the traders and visitors, enhanced legislation is the only sure way to protect green spaces like Uhuru Park from future infrastructural development. According to them legislation is ineffective in the absence of adequate enforcement, and this is what is lacking in conservation matters in the country. An increase enforcement of current legislation will be effective in protecting Uhuru Park. Apart from this, there should be increased institutional collaboration and creation of liaison committees to ensure smooth implementation of current legislation. Finally, both the county and national governments should formulate and implement the sustainable Kenyan cities policy to preserve open and green spaces.

4.6 Discussion of findings

4.6.1 Stakeholder perception on Nairobi Expressway Impact on Existing green Spaces

The objective of the study was to determine the legal challenges of infrastructure development on green spaces in Kenya with the focus of the study being the Nairobi expressway impact on green spaces. On the first objective which was to determine stakeholder perceptions on impact of Nairobi Expressway on green spaces, the findings showed that the construction of the Nairobi expressway did have an impact on the green spaces. The most notable impact was the resulting lack of shade and clean air resulting from the destruction of indigenous species of trees and vegetation which were uprooted to pave way for the construction of the multi-lane dual carriage. These findings are supported by existing literature studies on infrastructure developments and green spaces for instance, Ghent Carleigh considers transport infrastructural development projects to be the most disastrous in affecting the ecological ecosystems, hence arguing for need for regulations to cover the road construction projects and how they can be controlled to conserve the ecosystems[4]

Similarly, In China, green spaces have declined over the years because of increased investment in infrastructural development, which in most cases targets the unoccupied areas, and areas where the ecosystems are[5]. While the environmental bodies and other institutions continue to push for conservation of the ecosystems and not intruding into them when developing infrastructure, the priority has always gone to the transport infrastructure with environmentalists arguing that the continued transport infrastructural development in urban areas with degradation of the ecosystem resources affects the sustainability of future generations and deprives the environment from the benefits of the ecosystem services.

Another major finding from the study is that as a result of the construction of the Nairobi Expressway, new threat has emerged pointing to a possible physical encroachment of existing green spaces following a public notice published by the KeNHA and the Moja Expressway

[4] Ghent, Carleigh. "Mitigating the effects of transport infrastructure development on ecosystems." *Consilience* 19 (2018): 58-68

[5] Liu, On Yi, and Alessio Russo. "Assessing the contribution of UGS in green infrastructure strategy planning for urban ecosystem conditions and services." *Sustainable Cities and Society* 68 (2021): 102772.

Company dated 5th June 2023[6]seeking public opinion for Nairobi Expressway toll optimization and upgrading project which will involve the construction of new Expressway exit lanes at Uhuru Park and Museum Hill at the Central business district, which are close to existing green spaces. Mohammed Alamgir and others[7] pointed out that the rapid and extensive expansion of large-scale road and highway projects necessitates a comprehensive evaluation of their potential consequences as well-planned roads can bring significant economic and social benefits, but poorly executed projects can cause environmental social and political conflicts.

Another major finding was the lack of balance between infrastructure development and conservation that may be a barrier to green space policy development. The findings regarding lack of balance between development and conservation have been highlighted in other studies in different contexts. For instance, Kremer and others[8] in a study done in European and American nations. Established that a lack of regulatory integration into a framework that fully recognizes the multifaceted advantages of urban green spaces. Similarly, Eshetu et al.,[9] in Ethiopia found that institutional and regulatory barriers are the main obstacles to the actual planning and execution of green space policies. They emphasize the crucial role of involving institutions in the process of creating plans for green spaces as one of the main challenges facing the city's green space development plan and its implementation is the absence of fully participating institutions during the plan's preparation.

In China, ES in urban areas have declined over the years because of increased investment in infrastructural development, which in most cases targets the unoccupied areas, and areas where the ecosystems are[10]. While the environmental bodies and other institutions continue to push for conservation of the ecosystems and not intruding into them when developing infrastructure, the priority has always gone to the transport infrastructure. Environmentalists argue that the

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[6] The Nairobi Expressway,' Proposed Nairobi Expressway Toll Optimization and Upgrading Project Stakeholder and Public Consultation Forums, (Nairobi Expressway, June 2023) Available at https://www.nairobiexpressway.ke/download-pdf/36 accessed 11th November 2023

[7] Mohammed Alamgir and others, 'Economic, Socio-Political and Environmental Risks of Road Development in the Tropics' (2017) 27 Current Biology R1130 <https://linkinghub.elsevier.com/retrieve/pii/S0960982217311077> accessed 22 September 2023

[8] Kremer, Peleg, Zoé Hamstead, Dagmar Haase, Timon McPhearson, Niki Frantzeskaki, Erik Andersson, Nadja Kabisch, et al. "Key Insights for the Future of Urban Ecosystem Services Research." Ecology and Society 21, no. 2 [2016]

[9] Eshetu, Shibire Bekele, Kumelachew Yeshitela, and Stefan Sieber. 'Urban Green Space Planning, Policy Implementation, and Challenges: The Case of Addis Ababa.' Sustainability [2021] 13, no. 20: 11344.

[10] Liu, On Yi, and Alessio Russo. "Assessing the contribution of UGS in green infrastructure strategy planning for urban ecosystem conditions and services." *Sustainable Cities and Society* 68 (2021): 102772.

continued transport infrastructural development in urban areas with degradation of the ecosystem resources affects the sustainability of future generations and deprives the environment from the benefits of the ecosystem services.

4.6.2 Extent of the existing legal and institutional framework in safeguarding urban green spaces

The second objective was on the impact of the Nairobi Expressway impact on existing legal and institutional frameworks. The study established that there was a general lack of awareness of existing legal and institutional frameworks targeting green spaces as noted by the inability of participants to cite relevant legislation and regulations that provide protection to green spaces. The study established that there was a general lack of awareness of existing regulation and limited public participation of citizens in opinion-seeking forums on impended developments targeting green spaces. A review of studies in Kenya highlights the importance of public participation in development matters. Ouko et al. in a study on the perceptions of residents of the ES supplied by forest and how they engage in their management also concluded that the absence of local community input in forest management may have led to unsustainable resource extraction.[11] This is an example of the significant role played by the public in conservation.

The study established that an Environmental impact assessment was conducted prior to construction of the expressway. However, it also establishes that this was insufficient in assessing the potential harm caused by the Nairobi Expressway and failure to conduct Climate change analysis post construction as established in the case of *Greenbelt Movement & 4 Others v National Environmental Management Authority & Another; Kenya National Highways Authority (Interested Party) case,*[12] in which the Tribunal determined that the Nairobi expressway undertaking had obeyed EMCA, and the EIA Regulations, but had failed to execute a climate change analysis and in spite of this the EIA permit issued to KeNHAwas not withdrawn. Previous literature has also demonstrated the insufficiency of EIAs issued in Kenya for similar major developments.

[11] Ouko and others (n 123).

[12] 'Tribunal Appeal Net 19 of 2020 - Kenya Law' . <http://kenyalaw.org/caselaw/cases/view/209345/> accessed 30 September 2023.

Kosgey and Kioko-Mutinda[13] for instance, argues that impacts on local ecosystems are cumulative and the EIA is limited in its application as a tool for achieving sustainable development as far as the Nairobi Expressway project is concerned as it does not consider the cumulative impacts of the infrastructure on the local ecosystem overtime. Similarly, Benjamin Barczewski's[14] study on the Nairobi-Thika Highway Improvement Project established that there was a clash between Environmental Impact Assessment (EIA) study done on the project and the project proponent that led to downplaying of environmental impacts. Kakonge, in a review on why EIA fails in Kenya on this argument by indicating that for over four decades, Environmental Impact Assessments (EIAs) have been accepted as a vital part of project preparation.[15] Numerous African nations, including Kenya, have passed laws requiring EIAs to be undertaken on massive, potentially environmentally damaging projects. He cites major projects such as the Thika Superhighway and the Lamu Port which have been built without proper EIAs. This was also established in the case of *Save Lamu et al. v. National Environmental Management Authority and Amu Power Co. Ltd*. In which community members from Lamu filed an appeal against NEMA's decision to grant an Environmental Impact Assessment (EIA) license for the construction of a coal-fired power plant near an ecologically sensitive area, contesting the legality of the entire EIA process and highlighting the failure of the project proponent to conduct a proper analysis of alternative project options, which they believed violated Regulation 16(b) and 18 of the Environmental (Impact Assessment and Audit) Regulations, 2003.[16]

The study also established that even though infrastructure bodies such as KeNHA recognized the existing regulations regarding the protection of existing spaces, there was limited recognition of these laws in the major legislation that established the authority limited recognition of environmental regulation. The findings mirror existing studies on environmental regulation which show that certain urban planning policies in some developing countries especially in Africa are out of date and do not adequately reflect the present trends in

[13] Kosgei, Linda., Mutete, Mutinda. 'EIA as a Tool for Balancing Economic, Social and Environmental Considerations in Infrastructure Development: The Case of Nairobi Expressway, [2019] East Africa Law Journal 82
<https://heinonline.org/HOL/LandingPage?handle=hein.journals/easfrilaj2019&div=23&id=&page=>

[14] Benjamin Barczewski, 'How Well Do Environmental Regulations Work in Kenya? : A Case Study of the Thika Highway Improvement Project'

[15] 'Environmental Impact Assessment: Why It Fails in Kenya | Pambazuka News' (n 175).

[16] '20190626_Tribunal-Appeal-No.-Net-196-of-2016_decision.Pdf' (n 178).

urban growth might be attributed to their dysfunctional nature. Adjei Collins[17]It was found that some of the urban planning laws in place in several Sub-Saharan African nations were created roughly years ago in and are all still in effect making it challenging for these existing regulations to fully address some of the current issues with urban development, such as the increasing urbanization and the rapid loss of green spaces, because little to no revisions have been made to them. This applies to the Kenya Roads Act 2007 which does not address any environmental concerns.

4.6.3 Options for securing green spaces from infrastructure development.

To guard the existing green spaces, the second objective was to determine strategies to safeguard green spaces in Nairobi. Majority of the respondents felt that proper planning of infrastructural projects will significantly contribute to securing of green spaces planning was however insufficient without the existence of an appropriate legal framework to protect green spaces. Sentiments from key environmental legal experts however indicated that Kenya has a sound legal framework for protecting green spaces. These include the Environmental (Impact Assessment and Audit) regulations, 2003 which was subsequently amended in 2016 that requires an environmental impact assessment be done before projects with a significant impact on the environment to be done. According to him, the Expressway was a high-risk project that required an impact risk assessment which was completed prior to its construction. He additionally quoted the Kenya Forest Act of 2012 and the Water Act of 2002 that was revised in 2012 as key legislative instruments that have been instrumental in protecting green spaces in Nairobi and around the country.

A key effort to promote preservation of key green spaces that was noted by majority of respondents was providing support for environmental activism and community involvement in securing green spaces. The key expert from NEMA reiterated that to promote environmental management, support from communities and the public is required in environmental activism. One successful attempt according to him was the order by the NEMA to the contractors on the expressway to plant trees in all affected public spaces in which the expressway passed which included Uhuru Park, the Nairobi Arboretum, and the Nairobi National Park. This move was

[17] Adjei Collins Mensah. 'Urban Green Spaces in Africa: Nature and Challenges.' International Journal of Ecosystems. [2014] 4(1): 1-11

the result of environmental activism conducted by conservationist groups. Highlighting this case, he recognized that these efforts need more support from the public.

The study established key stakeholders in environmental conservation efforts. The findings established that the National Environmental Management Authority is the key stakeholder tasked with protection of green spaces. The respondents recognized that more efforts are required by the NEMA to implement legislation on the protection of green spaces as mandated through the Constitution of Kenya. They however recognized that current efforts by the body have not been enough in protecting green spaces. They recommend more efforts and stakeholder inclusion from the Government of Kenya, the national assembly and county assembly through the passage of legislations to secure green space sand protect them from land grabs and pollution and to prosecute persons and companies that destroy green spaces. The public should also play a role in promoting environmental activism by actively engaging in conservation efforts such as tree planting, proper waste management, sustainable farming practices and reporting incidents of environmental pollution and degradation.

Finally, more effort is needed to strike a balance between infrastructural development and conservation of green spaces. With the various acts available that recommend the protection of green spaces and others recommending urban development, the study recommended for the striking of a balance between development and conservation. This requires a collaboration between stakeholders within the Environmental Authority and those in urban and infrastructural development. The Nairobi Expressway is one project in which a balance was struck between conservation and development by involving all stakeholders prior to construction of the highway.

Additionally, the respondents proposed increased funding for conservation efforts at both the national government level and subsequently at the county level to promote more conservation of green spaces. Similar suggestions were made by researchers in Sub-Saharan Africa where it was established that the majority of African institutions for instance in Ethiopia are concerned about issues related to unprepared skilled individuals, insufficient staffing levels, financial constraints, and a lack of logistics where the agencies in charge of green spaces faced severe

financial limits in addition to a manpower shortfall.[18] Similarly the organization in charge of Abidjan's Parks and Gardens in was severely hampered by underqualified staff and inefficient finances.[19] The circumstances in Kumasi and the other Ghanaian cities were the same. It was discovered that the Department of Parks and Gardens, the government organization in charge of creating and maintaining green spaces, was in dire need of funding to carry out their planned operations, grossly inadequate staff, and numerous essential pieces of equipment.[20] Many African organizations that deal with green spaces find it challenging to enact policies to protect green spaces and to strictly implement legislation pertaining to them.

[18] Olaleye, D. O., Ayoade, O. J., and Omisoro, E. O. 'A multivariate analysis of factors influencing green space provision in residential neighbourhood of Sub-Saharan Africa.' Journal of Environment and Earth Science, [2013] 3(5), 138-146

[19] Djibril, C., Coulibaly, A., Wang, X., and Ousmane, D., 2012, Evaluating green space use and management in Abidjan City, Cote D'lvoire. International Journal of Economics and Management Engineering, 2(3), 108-116.

[20] Ibid

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

The main objective of the study was to study the legal challenges of infrastructural developments on green spaces in Kenya. Specifically, the study was focused on stakeholder perceptions regarding the impact of infrastructure development on green spaces in Nairobi, the extent to which existing regulations protect green spaces and options for securing green spaces in the wake of infrastructure development. This section presents the conclusions and recommendations based on the findings from the data collection and analysis.

5.2 Conclusions from the study

The main goal of the study was to legal challenges of infrastructural development on green spaces in Kenya. The study was anchored on the Social Ecological Systems (SES) theory by Berkes [1] as discussed in the work of Berkes and Folke, [2] which highlights the need for cooperation among key stakeholders within ecosystem, on the conservation and sustainable use of the ecosystems. The theory also notes that there is a need to balance infrastructural developments for economic growth and conservation of the green spaces, where the social systems and ecosystems are integrated for sustainable development.[3] The findings from this study concur with this theoretical as the Environmental Management and Co-ordination Act of Kenya (EMCA) 2019 and the urban areas and cities Act call for a balance between infrastructural development and conservation of green spaces.

From the study it was established that public participation in conservation matters is important. However, more participation from the public is needed as more conservation efforts are needed in protecting the existing green spaces. Kenya's 2010 constitution also supports this as it underscores the importance of sustainable development adhering to both legal and procedural human rights; public participation, engaging key stakeholders at all levels of development and adoption of international law as part of Kenya's law and implementing all international environmental governance principles with an aim of striking a balance between, economic

[1] Berkes, F., & Folke, C. (1998) Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience

[2] Berkes, F., & Folke, C.

[3] Winter, K, Lincoln, K., & Berkes, F. (2018). The Social-Ecological Keystone Concept: A Quantifiable Metaphor for Understanding the Structure, Function, and Resilience of a Biocultural System.

development, and social well-being in all its mega- infrastructure development projects.[4] To ensure effective environmental management, the Constitution encourages public participation and establishes guidelines for environmental impact assessments, audits, and monitoring. Furthermore, it prohibits any processes or activities that put the environment in danger and emphasizes on utilization of environment and its natural resources such as the green spaces for the benefit of the Kenyans.[5] This was also affirmed in the *Joseph Leboo & 2 Others case v Director of Kenya Forest Services & Another* (2013), when the Court stated that there is no prerequisite of demonstrating personal harm or loss for bringing an action to protect the environment.[6] This was also the case in the Environment Coordination and Management Act that preceded the Constitution of Kenya. Section 3(4) grants anyone the right to initiate legal action to protect the environment without the need to demonstrate personal loss or injury, upholding the right to participate in environmental concerns. This is supported by the EMCA Act of 1999 amended in 2015 which rests upon the foundational premise that every human being holds the entitlement to an uncontaminated and hygienic environment, this includes protection of the green spaces and their ecosystem services and if any such entitlement is infringed, they have the legitimate ability to seek redress.

Equally so, the study established that there are existing legal and institutional frameworks in Kenya enacted to protect the country's ecosystem. However public knowledge on these legislations remains poor and has mostly been left to environmental lobbyists, the civil society, and other environmental groups. For instance, even though a proper Environmental impact assessment was conducted prior to the construction of the expressway, the study established through an environmental audit that efforts to restore biodiversity by planting trees to compensate for vegetation loss are yet to be completed. This directly contravenes the Conservation of Biological Diversity and Resources, and access to genetic resources and benefits sharing 2006 regulations Conservation of Biological Diversity and Resources, and access to genetic resources and benefits sharing Regulations, [7] developed to protect

[4] 'Saving Uhuru Park: The Imperatives of Maintaining Open Public Spaces in the Wake of Mega-Infrastructural Projects Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 127).

[5] Art. 69(1) of the Constitution of Kenya 2010

[6] 'Environment and Land Case 273 of 2013 - Kenya Law' (n 140).

[7] 'Biodiversitybenefitsharingregulations_1.Pdf' (n 197). <http://www.nema.go.ke/images/Docs/Regulations/Biodiversitybenefitsharingregulations_1.pdf> accessed 18 September 2023.

biodiversity of Green spaces such as Uhuru Park which is considered as a biological diversity resource hence should be protected at all cost and environmental impacts associated with infrastructure development projects such as the Nairobi Expressway should be mitigated in order to conserve these spaces. The enforcement of these regulations is yet to be witnessed years after construction of the expressway.

From the study, it can also be concluded that proper planning of infrastructural projects should be done and will significantly contribute to securing of green spaces. Additionally, putting legal measures and involvement of the community are essential to securing green public spaces. These findings concur with Ferreira, Renato, and Silva who upon an assessment of the planning of green infrastructure network in Portugal established that the starting point for a green infrastructure exclusively in the cities is to have clear legislations and policies that provide a framework for implementing the infrastructural development projects while upholding ecosystems[8].

5.5 Recommendations from the Study

5.5.1 Recommendations for Law and practice

From the above study, several legal concerns can be observed. In the first objective the study established that the construction of the Nairobi expressway has had an impact on green spaces within Nairobi. Following the above-mentioned observations, the study recommends:

1. A multiple stakeholder involvement from NEMA, The Nairobi County government the Kenya Urban Roads Authority and KeNHA in compelling the road contractors to actively participate in restoring the lost biodiversity that was witnessed through the cutting of trees to participate in conservation restoration initiatives such as planting trees around Uhuru Park to compensate for the loss of vegetation and destruction of bird habitats as required failure to with attached legal implications for non-compliance
2. The National Environment Management Authority (NEMA) in collaboration with the contractors should also conduct regular climate change analysis of the construction project to assess cumulative impacts of the road construction on green spaces to identify and mitigate potential impacts of the project on the environment and engage in constant clean-

[8] Ferreira, José C., Renato Monteiro, and Vasco R. Silva. "Planning a Green Infrastructure Network from Theory to Practice: The Case Study of Setúbal, Portugal." Sustainability 13, no. 15 (2021): 8432.

up and maintenance of the natural rivers and waterways which are in close proximity to the expressway should be done (i.e., Nairobi and Ngong Rivers) to preserve the natural waterways. This follows observations from Richard Mulwa who suggested that an EIA may not be insufficient for projects with immense scale and capacity to degrade the environment like the Nairobi Expressway. Hence the law should include a segment of environmental valuation, with reports depositing all depreciations in monetary worth so that the environmental impacts can be weighed out with those of traditional goods and services appraised at market values.[9]

3. The conservation and protection of green spaces like Uhuru Park is dependent on a sound legislative framework. From the literature reviewed on extent of existing legislations, the study established that there are several pieces of legislation which advocate for environmental conservation, however these legislations are spread out around many frameworks which limits their effective application. Therefore, legislative amendments of existing frameworks are necessary to make them sound as well as the gazettement of public green spaces as protected areas to prevent them from current and future harm.
4. Additionally, more public education on existing legislations on conservation of green spaces is required to increase the involvement of the Kenyan public in conservation matters. Additionally, more political goodwill is required in the fight for conservation of green spaces in Kenya. Constant lobbying by civil society and environmental groups needs to be backed by strong political goodwill for these initiatives to work.
5. In securing green spaces, the study recommends multiple stakeholder involvement in securing green spaces. Having a strong multiple stakeholder support in conservation of ecosystem is an additional way to protect these spaces. To this end, both the government, private sector and the public should be involved in these efforts. The government can contribute to these efforts through financing of conservation initiatives both at the national and county levels and through proper financing of organizations committed to securing green spaces ad through passing of legislations to protect them, Private sector organizations can also contribute through financing initiatives as part of their sustainability initiatives. The Kenyan public is also crucial in voicing concerns over threats to natural green spaces as public outcry has proven to be successful in ensuring protection of green spaces.

[9] 'When Urban Green Spaces Meet Infrastructure Development in Kenya: A Case of the Nairobi Expressway Special Issue on the Impacts of the Nairobi Expressway on the Rights of People 2019 East African Law Journal 2019' (n 2).

6. Finally, the study has recognized the equal importance of having infrastructural developments as part of urbanization efforts in the cities. The study acknowledges this need but also proposes that a balance should be struck between conservation and development. To ensure this is achieved, any major development proposed should integrate multiple stakeholder involvement including public participation in development concerns to address the needs of all stakeholders.

5.5.2 Recommendations for future research

The above study has focused on the impact on infrastructural developments on the utilization of Uhuru Park in Nairobi County the study focused on stakeholder perspectives regarding the infrastructure at a point in time. The study hence recommends future studies to be conducted for extended periods of time to determine the cumulative impacts of the infrastructure on the existing ecosystems. Additionally, a more scientific approach will be useful in future to accurately determine the measurable impacts of the infrastructure on the surrounding ecosystems. Furthermore, future research should focus on infrastructural developments focusing on other ecosystems outside Nairobi City but within other major cities within Kenya. These will be an addition to existing literature on infrastructure development and ecosystems.

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APPENDICES

Appendix 1: Research Questionnaire

UNIVERSITY OF NAIROBI

FACULTY OF LAW

THESIS RESEARCH - MASTER OF ARTS IN ENVIRONMENTAL LAW

KEY INFORMANT INTERVIEWS (KII)

RESEARCH TITLE: LEGAL CHALLENGES OF INFRASTRUCTURAL DEVELOPMENTS IN KENYA: A CASE OF THE NAIROBI EXPRESSWAY.

RESEARCH PURPOSE: To investigate the legal challenges of Infrastructural Developments on green spaces in Kenya**.**

I'm Diana Mwaura, pursuing Master of Environmental Law at the University of Nairobi. The main objective of my research is to address legal challenges of Infrastructural Developments on green spaces in Kenya. The study will focus on the Nairobi Expressway.

Student Name: DIANA SHATIMBA MWAURA

REG NO: Z51/37614/2020

SECTION A: Demographic Information

1. Please indicate your gender

   Female [……] Male […….]

2. What is your age bracket?

   Below 20 years […….] 20 – 30 years [……]

   31 – 40 years […….] 41 – 50 years […….]

   51 – 60 years […….] Above 60 years […….]

3. Are you a resident of Nairobi County?

   Yes [……] No [……]

4. If yes, how long have you been a resident of Nairobi County?

Below 1 year [……] 1 – 3 years [……...]

4 – 6 years […….] 7 – 10 years [……]

Above 10 years [……]

5. How often do you visit Uhuru Park?

Only today […….] Daily […….]

once a week[…….] Less than once a week […….

SECTION B

Scale	1- Very low extent	2- Low extent	3- Moderate Extent	4- Great Extent	5- Very Great Extent

4. To determine Nairobi Expressway impacts on green spaces in Kenya.

a) Infrastructure Development

Statement	**1**	**2**	**3**	**4**	**5**
If the expressway passed through Uhuru Park as initially planned, I would stop going to the park					
Social amenities and ecosystem services have been moved for the development of the road					
The Park is more luxurious now with the expressway passing nearby than before					
The express way has opened doors for more infrastructural development around or within the park.					
Any future planned developments should not be done on open spaces like Uhuru Park					
I personally benefit from the expressway more than I benefit from the park					

b) Accessibility and Utilization

Statement	1	2	3	4	5
Accessing Uhuru Park has been difficult since the development of expressway.					
Can now access Uhuru Park easily after the completion of the expressway					
I feel lesser secure in the park than it was before the expressway					
I frequently utilize Uhuru Park than before the expressway project.					
The park is fully utilized than it was before the expressway					
Cost of accessing the park is now too expensive					
The rule accessing the park are now more stringent					
Management of the park has improved					

c) Pollution and Environmental Degradation

Statement	1	2	3	4	5
There is more **noise** pollution in the park after the expressway					
Air quality has declined **after** the increase in activities along the park					
The area around the park experiences floodings more frequent than before					
Infrastructural projects like expressway lead to degradation of the environment					

The environment along the park is not as serene as it used to be before the expressway					

Scale	1- Very low extent	2- Low extent	3- Moderate Extent	4- Great Extent	5- Very Great Extent

5. To appraise the extent of the existing legal and institutional framework in safeguarding urban green spaces

Legal and Institutional Framework

Statement	**1**	**2**	**3**	**4**	**5**
I am Aware of the laws and institutions that seek to protect green spaces like Uhuru Park					
Any public outcries on intended encroachments to the park have been effectively acted upon by the relevant authorities					
I am confident on the ability of bodies like NEMA to protect open spaces like Uhuru Park					
I am aware of a previous case of opinion-seeking from the members of the public on impended developments targeting open spaces					
Iam aware of the litigations					

6. To determine the options for securing green spaces in the face of infrastructure development.

According to you, to what extent would the following aspects contribute to securing the green spaces from infrastructure development?

Aspect	1	2	3	4	5
Proper planning of the infrastructure projects to coexist with green spaces					
Involvement of the community					
Putting across legal measures to safeguard the green spaces					
Supporting environmental activists					
Stopping infrastructure projects that interfere with green spaces					

7. To examine the stakeholders' role in striking a balance between infrastructural development and protection of green spaces.

   Among the following stakeholders, how active should there be contribution in safeguarding green spaces

List of stakeholders	Active	Not sure	Inactive
The County Government, Nairobi Metropolitan Service			
The national government			
County Assembly through legislation			
National assembly through legislation			
Activists e.g			
Government agencies e.g., NEMA			
Members of the public			

International Bodies			

8. What are some of your recommendations on what should be done to strike a balance between infrastructural development and protection of green spaces?

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Supply of Ecosystem Services

Statement	**1**	**2**	**3**	**4**	**5**
I visit Uhuru Park in search of a better place to take a rest and breath the fresh air					

I visit the park to get some refreshments from the vendors					
I use the park as a source of income through selling goods to other users					
I visit the park to see the sceneries and relax my mind					

9. What are some of the improvements you would like to have to ensure Uhuru park is protected?.....
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Appendix 2: KII Interview Schedule

UNIVERSITY OF NAIROBI

FACULTY OF LAW

THESIS RESEARCH - MASTER OF ARTS IN ENVIRONMENTAL LAW

KEY INFORMANT INTERVIEWS (KII)

RESEARCH TITLE: LEGAL CHALLENGES OF INFRASTRUCTURAL DEVELOPMENTS IN KENYA: A CASE OF THE NAIROBI EXPRESSWAY.

RESEARCH PURPOSE: To investigate the legal challenges of infrastructural developments on green spaces in Kenya**.**

Student Name: DIANA SHATIMBA MWAURA

REG NO: Z51/37614/2020

Section A: KEY INFORMANT PROFILE

1.Name of the key informant	
2.The occupation of Key Informant	
3.Experience ((in terms of years) of the key informant in the occupation	
4. The Organization where the key informant works	

Section B: GUIDING QUESTIONS

1. How is planning done to ensure infrastructural developments do not collide with green spaces?
2. Infrastructural development is critical just like the green spaces, which of the two do you think should be given top priority, and why?
3. What are some of the measures that the government (county and national government) and other relevant authorities put in place to reduce pollution and environmental degradation during infrastructural projects development?
4. Are there key legal backings to support infrastructural development over conservation of green spaces? If yes, what are some of these laws? If no, are there plans to have some of these laws in place?
5. What changes do you think should be made to the legal and policy framework governing green spaces to make them more effective?
6. How would you comment on the engagement of the stakeholders particularly the members of the public regarding green spaces and their coexistence with infrastructural development? Have there been such engagements, and how effective have they been?
7. How effective is the institutional collaboration between national and county government in dealing with protection of green spaces in light of the quest for infrastructural development?
8. In your opinion, what do you think should be the key changes made to how green spaces are protected currently from infrastructural development?