



ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED CANOPY WALKWAY IN SEBITOLI TOURISM ZONE KIBALE NATIONAL PARK IN THE VICINITY OF SEBITOLI A VILLAGE, KASWA PARISH, BUSORO SUB-COUNTY, KABAROLE DISTRICT, UGANDA



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TABLE OF CONTENTS

TEAM OF ESIA SPECIALISTS	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	xi
LIST OF FIGURES	xiii
ACRONYMS AND ABBREVIATIONS	xv
EXECUTIVE SUMMARY	xvi
1. INTRODUCTION	1
1.1. General Information and Background	1
1.2. Uganda Wildlife Authority the proponent	1
1.3. The Rationale	2
1.4. Project Overview	3
1.5. Project Objective	4
1.6. Project cost	4
1.7. Relationships to other Projects	4
1.8. Environmental and Social Impact Assessment Process	5
1.9. Project classification according to World Bank	5
1.10. Purpose of the Environmental and Social Impact Assessment	6
1.11. Objectives of this EIA	6
1.12. Considerations	7
1.13. NEMA Terms of Reference approval conditions	8
1.14. Structure of the Environmental Social Impact Statement	10
2. PROJECT DESCRIPTION	14
2.1. The Nature of the Project	14
2.2. Location	14
2.3. Project Area of Influence	20
2.4. Design Concept	20
2.5. Materials to be used	26
2.6. Lifecycle of materials	28
2.7. Material choice justification	28
2.8. Canopy Walkway height justification	29
2.9. Health and safety considerations	29
2.10. Construction and operation Phases	29
2.9.1 Reinforced Concrete Foundations, Stub Columns and Abutments	30
2.9.2 Columns	31
2.9.3 Bridge Superstructure	31
2.9.4 Tower	32
2.9.5 Erection and General set-up	33
2.11. Associated infrastructure	33
2.12. Power supply	33

2.13.	Workforce	34
2.14.	Waste management	35
2.15.	Tourism and land use	35
2.16.	Post construction landform and use	35
2.17.	Canopy Maintenance strategy	36
2.18.	National Park Management	36
2.19.	Project avoidance measure	37
2.20.	Environmental buffers	37
2.21.	UWA approach during project implementation	38
2.20.1	Pre-Construction Planning	38
2.20.2	Construction Phase	38
2.20.3	Operation and Management	39
2.20.4	Decommissioning and Closure	39
2.20.5	Monitoring and Adaptive Management	39
2.22.	Decommissioning and closure	40
2.21.1	Decommissioning	40
2.21.2	Rehabilitation	40
2.21.3	Landscape Management	40
2.21.4	Forest Restoration	41
2.23.	Alternatives	41
2.24.	Current KNP operations	41
2.25.	Cost Benefit Analysis of the Project	42
2.26.	Benefits related to the project	42
2.27.	Costs related to the project	44
3.	POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK	45
3.1.	Policy Framework	45
3.1.1	The National Environment Management Policy, 1994	45
3.1.2	The Uganda Wildlife Policy, 2014	45
3.1.3	The Uganda Forestry Policy, 2001	46
3.1.4	National Environment Health Policy, 2005	46
3.1.5	The National Water Policy, 1999	46
3.1.6	Uganda Gender Policy 2007	47
3.1.7	National Policy on Elimination of Gender Based violence, 2016	47
3.1.8	National Policy on Disability, 2006	47
3.1.9	National Orphans and other Vulnerable Children's Policy, 2004	48
3.1.10	The Uganda National Land Policy, 2013	48
3.1.11	The National Aids Policy (2004)	48
3.1.12	Uganda's Vision 2040	49
3.1.13	National Policy on HIV/AIDS in the World of Work, 2007	49
3.1.14	The National Policy on HIV/AIDS (2004)	50
3.1.15	The Uganda National Youth Policy 2016	50
3.2.	Legal Framework	50

3.2.1	The Constitution of the Republic of Uganda.....	50
3.2.2	The National Environment Act, 2019	51
3.2.3	Local Governments Act, Cap 243	51
3.2.4	The Uganda Wildlife Act, 2019	51
3.2.5	The National Forestry and Tree Planting Act, 2003.....	52
3.2.6	The Water Act Cap 152, 1995.....	52
3.2.7	The Plant Protection and Health Act 2015	53
3.2.8	The Access to Roads Act, 1965.....	53
3.2.9	The Historical and Monuments Act, 1967	53
3.2.10	The Occupational Safety and Health Act, 2006	54
3.2.11	The Workers Compensation Act, 2000.....	54
3.2.12	The Public Health Act, 1964.....	54
3.2.13	Employment Act No 6, 2006	55
3.2.14	Children Act Cap 59	56
3.2.15	The Traffic and Road Safety Act, 1998	56
3.3.	Regulatory Framework.....	56
3.3.1	The National Environment (Environmental and Social Assessment) Regulations, 2020.....	56
3.3.2	National Environment (Noise Standards and Control) Regulations, 2003.....	57
3.3.3	The National Environment (Waste Management) Regulations, S.I. No.49, 2020	57
3.3.4	The National Environment (Control of Smoking in Public Places), Regulations 2004	58
3.3.5	The National Environment Audit Regulations, 2020	58
3.3.6	The Water (Waste Discharge) Regulations, 1998	59
3.3.7	The Guidelines for Environmental Impact Assessment in Uganda, 1997.....	59
3.3.8	The Environmental Audit Guidelines for Uganda, 1999.....	59
3.3.9	The National Environment (Minimum Standards for Management of soil quality Regulations, 2001)	60
3.3.10	Employment Sexual Harassment) Regulation, 2012	60
3.4.	Institutional Framework	60
3.5.	Multilateral Agreements	61
3.5.1	Convention for the Protection of the Ozone Layer and Its Montreal Protocol	62
3.5.2	United Nations Framework Convention on Climate Change (UNFCCC).....	62
3.5.3	Convention for the Safeguarding of the Intangible Cultural Heritage, 2003	63
3.5.4	The Convention on Biological Diversity 1992 (CBD)	63
3.5.5	The Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention, 1972)	63
3.5.6	The African Convention on the Conservation of Nature and Natural Resources, 1968.....	64
3.5.7	UNESCO World Heritage Convention, 1972.....	64
3.6.	World Bank Environmental and Social Standards	65
3.6.1	ESS1: Assessment and Management of Environmental and Social Risks and Impacts	65
3.6.2	ESS 2: Labour and Working Conditions	66
3.6.3	ESS 3: Resource Efficiency and Pollution Prevention and Management.....	66
3.6.4	ESS 4: Community Health and Safety.....	67
3.6.5	ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.....	67
3.6.6	ESS 10: Stakeholder Engagement and Information Disclosure.....	68

3.7.	The World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines), 2012	69
3.8.	Permit requirements	69
4.	BASELINE ASSESSMENT	71
4.1.	Baseline Condition	71
4.1.1	History of the area	71
4.1.2	Legal Progress Status of KNP	71
4.2.	Biological Environment	72
4.2.1	Floral	72
4.2.2	Fauna	87
4.2.3	Avifauna	92
4.2.4	Herpetofauna assessment	95
4.3.	Physical environment	102
4.3.1	Landscape and Physical features	102
4.3.2	Geology	103
4.3.3	Soils	103
4.3.4	Climate	103
4.3.5	Rainfall	104
4.3.6	Climate change	105
4.3.7	Canopy Walk NetZero	106
4.3.8	Air and noise quality measurements	107
4.3.9	Water	114
4.3.10	Archaeology and Cultural Heritage	121
4.3.11	Seismicity	128
4.4.	Socio-Economic Baseline	129
4.4.1	Administrative structure	129
4.4.2	Location of Busoro Sub County	130
4.4.3	Population and demographics	131
4.4.4	Housing and settlement	133
4.4.5	Land tenure and land use	135
4.4.6	Livelihood activities	138
4.4.7	Tourism	141
4.4.8	Social Infrastructure and services	147
5	STAKEHOLDER PARTICIPATION, ISSUES AND CONCERNS	153
5.1	Approach	153
5.1.1	Scope	153
5.2	Public engagement	153
5.3	Objectives of stakeholder engagement	154
5.4	Stakeholder engagement and consultation requirements	154
5.4.1	National requirements	154
5.4.2	World Bank requirements	155
5.5	Stakeholder identification and analysis	156
5.5.1	Stakeholder engagement methods and schedule	158

5.5.2	Comments raised by stakeholders during the scoping phase	162
5.5.3	Comments raised by stakeholders during ESIA	169
6	PROJECT ALTERNATIVES	184
6.1	No project alternative	184
6.2	Action option	184
6.3	Site Location Alternatives	185
6.3.1	Description of the canopy walk route options	185
6.3.2	Selection Criteria for the location alternatives	189
6.3.3	Major Environmental issues along the proposed routes	189
6.3.4	Analysis of the route options	190
7	IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES	194
7.1	Impact Identification	194
7.1.1	Impacts Associated with the Construction Phase	194
7.1.2	Impacts associated with Operation Phase	195
7.1.3	Impacts associated with Decommissioning Phase	196
7.2	Impact Evaluation	196
7.2.1	Evaluation of Impact Significance	196
7.3	Impacts Associated with Project Phases	197
7.4	Pre-Construction Phase Impacts (Legal / Regulatory Framework)	202
7.4.1	Permitting Challenges	202
7.4.2	Violation of Environmental Laws	203
7.4.3	Land Use/KNP users' Conflicts	204
7.4.4	Contractual Disputes	205
7.5	Construction Phase Impacts (Biological Environment)	206
7.5.1	Vegetation Removal	206
7.5.2	Disruption of Ecological Processes	206
7.5.3	Introduction of Invasive Species	207
7.5.4	Habitat Loss	208
7.5.5	Disruption of Wildlife	209
7.5.6	Disturbance to nesting sites	210
7.5.7	Loss of Native Vegetation	210
7.6	Construction Phase Impacts (Physical Environment)	211
7.6.1	Soil Disturbance	211
7.6.2	Water Pollution	212
7.6.3	Visual Intrusion	213
7.6.4	Noise Pollution	213
7.7	Construction Phase Impacts (Socio-Economic Environment)	214
7.7.1	Job Creation	214
7.7.2	Income Generation	215
7.7.3	Tourism Development	215
7.7.4	Infrastructure Improvement	216
7.7.5	Community Engagement	217

7.7.6	Increased Human Presence.....	218
7.7.7	Community Health and Safety Risks	219
7.7.8	Effects of social cohesion (distortion of marriages, increased spread of STDs/STIs etc)	220
7.7.9	Pressure on utilities as a result of an increase in the number of people in the area during construction	221
7.8	Operational Phase Impacts (Legal / Regulatory Framework)	221
7.8.1	Regulatory Compliance	221
7.8.2	Public Safety Regulations	222
7.8.3	Regulatory Changes.....	223
7.9	Operational Phase Impacts (Biological Environment)	224
7.9.1	Disturbance to Wildlife.....	224
7.9.2	Introduction of Exotic Species.....	225
7.9.3	Spread of Invasive Species.....	225
7.9.4	Accidental wildlife disturbance	226
7.9.5	Altered Predator-Prey Dynamics	227
7.9.6	Loss of Nesting Sites.....	228
7.9.7	Spread of Diseases	229
7.9.8	Altered Plant-Animal Interactions.....	230
7.10	Operational Phase Impacts (Physical Environment)	231
7.10.1	Structural Degradation.....	231
7.10.2	Noise Pollution	232
7.10.3	Visual Impact	233
7.10.4	Impacts associated with increased human presence	234
7.10.5	Risk of Accidents	235
7.10.6	Resource Consumption	237
7.10.7	Generation of solid waste.....	237
7.10.8	Introduction of exotic species.....	238
7.10.9	Conflict with Wildlife	239
7.11	Operational Phase Impacts (Socio-Economic Environment)	239
7.11.1	Tourism Revenue	239
7.11.2	Local Employment	241
7.11.3	Education and Awareness.....	242
7.11.4	Cultural Disruption	243
7.11.5	Overcrowding and Congestion.....	243
7.11.6	Increased human-wildlife conflicts	244
7.11.7	Failure for the community to benefit from the increase in the number of tourists to the area	245
7.11.8	Insecurity.....	245
7.11.9	Economic Dependency	245
7.12	Decommissioning Phase Impacts (Legal / Regulatory Framework).....	246
7.12.1	Restoration Obligations	246
7.12.2	Contractual Agreements.....	247
7.12.3	Closure and Access Restrictions	248
7.12.4	Regulatory Enforcement.....	248
7.13	Decommissioning Phase Impacts (Biological Environment)	249

7.13.1	Vegetation Loss	249
7.14	Decommissioning Phase Impacts (Physical Environment)	250
7.14.1	Structural Removal	250
7.14.2	Soil Disturbance	251
7.14.3	Visual Disruption	251
7.14.4	Noise Pollution	252
7.14.5	Air Pollution	253
7.14.6	Waste generation	254
7.14.7	Risk of Soil Contamination	255
7.14.8	Residual Impacts	256
8	RISK ASSESSMENT	257
8.1	Risk assessment enabler	257
8.2	Risk assessment tools	257
8.3	Identification of risks and Categorization of consequence	258
8.3.1	Assessed Likelihood	259
8.3.2	Risk level assignment	261
8.3.3	Treat risks	261
8.3.4	Monitor and review	262
8.3.5	Cumulative impacts	262
9	CUMULATIVE IMPACT ASSESSMENT	264
9.1	The rationale and methods for cumulative assessment	264
10	DECOMMISSIONING	267
10.1	Timeline	267
10.2	Procedure	267
11	ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	270
11.1	Impact Management	270
12	ENVIRONMENTAL AND SOCIAL MONITORING PLAN	282
12.1	Baseline monitoring	282
12.2	Impact/effect monitoring	282
12.3	Compliance monitoring	282
12.4	Mitigation monitoring	282
13	CONCLUSION	294
13.1	Conclusion	294
	REFERENCES	297
	APPENDICES	302
	Appendix 1: Approved NEMA TOR Approval Letter	302
	Appendix 2: Biodiversity Assessment Reports	305
	Appendix 2 (a): Checklist of floral	305
	Appendix 2 (b): Checklist of mammals	312
	Appendix 2 (c): Checklist of Birds	313
	Appendix 2 (d): Checklist of amphibians and reptiles	316

Appendix 3: Stakeholder Consultations	319
Appendix 3 (a): List of consulted and engaged persons.....	319
Appendix 3 (b): Sebitoli Local Council I Letter of no objection and a copy of wild animal raids assessment/report from the LC1 Executive.....	327

LIST OF TABLES

Table 1-1: NEMA Terms of Reference Approval conditions	8
Table 1-2: Structure of the ESIS.....	11
Table 4-1: Period of transition into a national park	71
Table 4-2: Distribution of plant species recorded from the project area according to plant family	80
Table 4-3: List of global and National threatened species recorded from the project site	82
Table 4-4: List of plant species protected under regulations 2016	83
Table 4-5: List of known invasive species within the project footprint and project area of influence.....	85
Table 4-6: Mammal species recorded in the proposed project area	89
Table 4-7: Species detected during the ecological assessment	92
Table 4-8: Species of birds encountered at relatively high levels of regularity.	94
Table 4-9: Bird species of Conservation Concern	95
Table 4-10: Amphibian species recorded during the survey of the canopy walk project area	97
Table 4-11: Reptile species recorded during the survey of the canopy walk project area.....	97
Table 4-12: Habitat for the recorded amphibians and their general distribution ecology.....	99
Table 4-13: Habitat for the recorded reptiles and their general distribution ecology	99
Table 4-14: Fort Portal climatic conditions by selected month	104
Table 4-15: National Air Quality Standards.....	107
Table 4-16: WHO Air Quality Guidelines.....	108
Table 4-17: Maximum Permissible noise levels for construction (on surrounding environment)	108
Table 4-18: Maximum permissible noise levels for construction (on workers).....	108
Table 4-19: Field equipment used for the air quality and noise assessment	109
Table 4-20: Air Quality levels recorded at the selected points of assessment.....	112
Table 4-21: Noise levels recorded at the selected points of assessment.	113
Table 4-22: Site descriptions and locations of the select sites assessed for baseline water quality characteristics of the proposed Canopy Walk in Sebitoli Tourism Zone.....	115
Table 4-23: Surface water quality in the project area	119
Table 4-24: Potable and ground water characteristics in the project area	120
Table 4-25: Results of the Consultative Meetings with Stakeholders.....	125
Table 4-26: Findings of the Archaeological Survey in the Proposed Canopy Walk Project Area	126
Table 4-27: Administrative units in the district are as follows.....	129
Table 4-28: Parishes and No. of villages	130
Table 4-29: Age brackets of respondents	131
Table 4-30: Number of people in Hhs interviewed	132
Table 4-31: Visitor arrivals to Uganda by purpose of visit (000') 2014-2017	142
Table 4-32: Summary of Visitation to Kibale National Park for the Past 12 Years (2011 to 2022)	143
Table 4-33: Respondents proposed measures to reduce human-wildlife conflicts	144
Table 4-34: Tourism activities local community can engage in	146
Table 4-35: Number of schools per administrative unit	147

Table 4-36: Health Facilities in Kabarole District.....	150
Table 5-1: List of project relevant stakeholders.....	157
Table 5-2: Stakeholders engaged during the ESIA	159
Table 5-3: Comments raised at the scoping phase	162
Table 5-4: Comments and concerns raised by various stakeholders.....	170
Table 6-1: Summary of issues (route options for the canopy walk).....	190
Table 6-2: Weighing of alternatives /canopy walk route selection criteria	191
Table 7-1: Impact Correlation Matrix for the proposed development of the Canopy Walk in Sebitoli KNP	198
Table 8-1: Likelihood matrix	259
Table 8-2: Risk matrix	261
Table 9-1: Lists of assumed projects planned in and around the area	265
Table 11-1: Plan for Implementation of Environmental and Social Enhancement Measures for the proposed Canopy walk.....	271
Table 12-1: Environmental and Social Monitoring Plan	284

LIST OF FIGURES

Figure 2-1: Sebitoli Sector in relation to Africa and Uganda	15
Figure 2-2: Location of the proposed canopy Walk in Sebitoli Tourism Zone of KNP	16
Figure 2-3: Proposed Control Network for the canopy walk.....	17
Figure 2-4: Show KNP and Districts bordering the Park.....	18
Figure 2-5: Location of Sebitoli Tourism Zone at the northern tip of Kibale National Park	19
Figure 2-6: Selected option of the canopy walk	22
Figure 2-7: Canopy Walkway route design options.	23
Figure 2-8: Site plan for the proposed canopy walkway	24
Figure 2-9: Sketch indicating the height intervals of 4m after ground leveling at 16m from point X1.....	25
Figure 2-10: The developed artistic impression of the tower and main canopy walkway	26
Figure 2-11: Connection of the railing onto the main spine or main curved steel beam.....	27
Figure 2-12: Canopy walk supported at 12m intervals	27
Figure 2-13: View of the canopy walk from Point X2 towards X1.....	28
Figure 4-1: Pictorial view of vegetation assemblages at the proposed site and neighborhoods.....	79
Figure 4-2: Growth form distribution of plant species recorded from the project landscape.....	81
Figure 4-3: IUCN species categorization	82
Figure 4-4: Bush back species	90
Figure 4-5: Duiker species	90
Figure 4-6: Bush duiker and genet	91
Figure 4-7: Mongoose and bush duiker	91
Figure 4-8: Baboon and Elephant.....	91
Figure 4-9: Crested Guinea Fowls <i>Guttera pucherani</i> (at 36N 0209019 0071036).....	94
Figure 4-10: Showing sampling points where Herpetofauna data was collected.....	96
Figure 4-11: Captured <i>H. cinnamomeiventris</i> and <i>A. atricolis</i> in the study area	98
Figure 4-12: Rainfall variation adopted from: Struhsaker (1997)	105
Figure 4-13: Area Topography, runoff and the discharge points into Sebitoli stream	117
Figure 4-14: Pictures taken during sampling.....	118
Figure 4-15: Location of Archaeological and Cultural Heritage Sites in the Proposed Project Area.....	124
Figure 4-16: Seismic zoning for Uganda.....	129
Figure 4-17: Access to the proposed site.....	131
Figure 4-18: Marital status of respondents.....	132
Figure 4-19: Showing settlements in Sebitoli village, access to the proposed site and the proposed site	134
Figure 4-20: Nature of housing in Sebitoli village	135
Figure 4-21: Land ownership status of interviewed households	136
Figure 4-22: Map showing land use in Kabarole district	137
Figure 4-23: Land uses in Sebitoli village	138
Figure 4-24: Livelihood sources for respondents	140
Figure 4-25: Other livelihood sources.....	141

Figure 4-26: Kiamara Primary School.....	149
Figure 4-27: Kihingami Vocational Eco-tourism Training Institute.....	150
Figure 4-28: Kaswa HC III.....	152
Figure 5-1: Pictorial taken during stakeholder engagement.....	162
Figure 6-1: Features within option 1 site.....	186
Figure 6-2: Combination of the proposed Canopy walk start points for options 1-3.....	187
Figure 6-3: Combination of the proposed Canopy walk options 1-3.....	188

ACRONYMS AND ABBREVIATIONS

Aol	Area of Interest
CHS	Circular Hollow Sections
CW-in-KNP	Canopy Walk in Kibale National Park
ESF	Environment Social Framework
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESS	Environmental and Social Standards
GDP	Gross Domestic Product
GMP	General Management Plan
IAPS	Invasive Alien Plant Species
IFPA-CD	Investing in Forests and Protected Areas for Climate Smart Development
IUCN	International Union for Conservation of Nature
KNP	Kibale National Park
LG	Local Government
MDAs	Ministries, Departments, and Agencies
MTWA	Ministry of Tourism, Wildlife and Antiquities
MWE	Ministry of Water and Environment
NDP	National Development Plans
NEA	National Environment Act
NEMA	National Environment Management Authority
NFA	National Forestry Authority
NGO	Non-Governmental Organizations
NT	Nearly Threatened
PA	Protected Areas
PAI	Project Area of Influence
QENP	Queen Elizabeth National Park
ToRs	Terms of Reference
URA	Uganda Revenue Authority
USAID	United States Agency for International Development
UV	Ultraviolet
UWA	Uganda Wildlife Authority
VAT	Value Added Tax
VU	Vulnerable
WB	World Bank

EXECUTIVE SUMMARY

Project Overview

The Uganda Wildlife Authority (UWA) proposes to establish a Canopy Walk in Kibale National Park (KNP) in Western Uganda intending to broaden the range of activities available to tourists and generate additional sources of income. This proposal introduces a novel tourism experience, enabling visitors to explore and gain a deeper understanding of the KNP forest canopy, while also serving as a potential revenue-generating asset.

Through funding secured from the World Bank for the implementation of the Investing in Forests and Protected Areas for Climate Smart Development (IFPA-CD) Project, UWA is tasked with constructing and managing the Canopy Walk in KNP, positioning the agency to capitalize on its competence to boost the tourism sector. The envisioned Canopy Walk project leverages UWA's extensive experience in sustainable resource utilization, proficiency in managing protected areas, established production interests, and collaboration with stakeholders.

The proposed Canopy Walk project is located in Sebitoli Tourism Zone within KNP, close to Sebitoli A Village, Kaswa Parish, Busoro Sub County, Kabarole District, along Kampala-Fort Portal Road. The site is accessed through Sebitoli UWA Park Visitor Center Gate, along Kampala - Fort Portal Road. There are several villages surrounding the protected area but those directly bordering KNP and in proximity to the proposed canopy walkway site are Sebitoli A and Sebitoli B.

Rationale

The Sebitoli Tourism Zone is designated to augment and boost revenue streams for UWA. The proposed design of the Canopy walkway provides an excellent exploration experience for tourists. Furthermore, the construction of the Canopy walk is planned to avoid cutting any trees in the area. The design and location of the Canopy Walk have been planned to avoid and minimize disruption to the biodiversity and natural resources of the park.

Project Objective

UWA's tourism development strategy identifies the need to diversify the activities that tourists can enjoy within the protected areas and to create new sources of income generation. As part of this strategy, UWA wishes to explore the possibilities of a Canopy Walkway Tourism facility within KNP at Sebitoli sector to: provide a new tourism experience; allow exploration and better understanding of the forest canopy; and generate a new income stream.

ESIA Requirement

To ensure sustainability and meet national requirements (NEA, 2019-Schedule 5 (10-e), an Environmental and Social Impact Assessment (ESIA) is required whose primary objective is to assess and analyze the potential effects of the proposed Canopy Walk development in KNP. The assessment aims to identify, predict,



and evaluate impacts on the social, economic, and ecological aspects. To ensure project sustainability and minimize adverse effects, the proposed mitigation and enhancement measures will be integrated into the project's design, construction, operation, and decommissioning processes.

Alternatives

As part of the Canopy-walk feasibility studies undertaken in 2021, a number of design options were presented and explored and the alternative of constructing a 450-meter loop coupled with a 27-meter-high lookout tower scored higher than the others. It was found that the proposed site, height and length of the tower, plus the watch tower would offer a complete out-and-back experience of Sebitoli in KNP.

Overview of the existing environment

The KNP spans a broad altitudinal range, ascending from 1,110 m in the southern region to 1,590 m in the far north where the Canopy Walk is located in Sebitoli. The park encompasses undulating terrain on the primary Ugandan plateau, with drainage flowing in a southerly direction. The landscape of Sebitoli in KNP is a mesmerizing blend of contrasting elements, creating a unique and captivating scenic view. As the park adjoins tea estates and inhabited environments, a picturesque mosaic unfolds, seamlessly intertwining the greenery of tropical rainforests with the orderly rows of tea plantations. The transition from tea estates to the tropical rainforest is marked by a gradual shift, sometimes characterized by riparian changes. The combination of agroforestry practices in tea estates, with their meticulously manicured rows of tea plants, creates an overview of constant green that stretches out towards the park's boundaries. This integrated landscape provides a striking contrast to the untamed wilderness that lies beyond.

The geology of Sebitoli is part of metamorphic and intrusive rocks that cover Buganda-Tooro, Karagwe-Ankolean and the Basement Complex. Many of the past and most recent studies describe the geology of the area as one consisting of various lithological units ranging from Proterozoic metamorphic complex groups to younger volcanics. The rocks in the area have been subjected to extensive weathering and erosion leading to the deposition of unconsolidated sediments and volcanics.

River Mpanga, the primary surface water resource in the project area, lies approximately 500m uphill from the proposed development. This river holds significant socio-economic importance as it supplies water for various purposes, including meeting the domestic water needs of downstream towns. The River Mpanga is integral to the Lake George catchment area where it ultimately drains. Presently, upstream activities such as a densely populated settlement and insufficient waste management in Fort Portal City have adversely affected the water quality of this resource. Consequently, any additional sediment loads and pollutants introduced during project execution (in case this happens) are likely to result in irreversible ecological damage.

Flora: The area documented a total of 220 plant species. Among these, 133 species were identified within the proposed site's direct footprint for the Canopy walk, while 207 were observed in the project area of influence (indirect footprint). The recorded species belonged to 164 genera and 74 families. Notably, the primary and nearly climax forest patches in the project area, where the installation will be situated, exhibited



lower species richness compared to the regenerating forest patch, as well as the mosaic landscapes of bushed grassland, bushland, and woodland/bushland in the immediate site surroundings. In the context of family distribution, the specific project footprint documented a lower number of plant species. In general, both the project area of influence and the direct footprint observed 17 species from the Moraceae family, making it the most prevalent. Within the project footprint, two globally threatened plant species, namely *Prunus africana* (VU) and *Milicia excelsa* (NT), were identified. Their presence does not call for a critical habitat assessment since they are already protected under the protected area management plan.

Fauna: Mammals that include primates and herbivores were studied, as well as birds, amphibians and reptiles. The surveys established the occurrence of 20 species belonging to 7 mammal families. The Cercopithecoid primates were the more visible mammals observed foraging in and around the project area. The surveys documented a total of five threatened mammal species, with only two of them (Leopard and Giant Forest Hog) reported to be present in the area, yet no direct evidence of their occurrence was observed. The evidence for the other three species was mainly obtained through camera traps and these include those in chapter 4 in Figures 4.5 – 4.9.

The surveys identified a total of 102 bird species in the area, constituting approximately 30% of the overall avian diversity within KNP. The majority of bird species recorded was at low levels of regularity. Two of the species (were listed by Carswell et al (2005) as of regional responsibility, two as Regionally Near threatened and one as regionally Vulnerable. The more recent assessment by MTWA (2018) suggests that these threat categories were since overtaken and no update has been undertaken in recent years.

A total of eight amphibian species were recorded. Among them, one belonged to the toad category, while the remaining seven were identified as frogs. These species were observed in proximity to water sources, including water pools and the Papyrus swamp situated in the valley points to the southern side of the Sebitoli canopy walk. The recorded amphibian species span four families and four genera. The survey did not identify any species of conservation significance. All encountered species are classified as least concern according to the 2020 IUCN Red List of threatened species. The IUCN considers these species to be widespread and common across much of their range.

A total of six reptile species were identified. These comprised four snakes, one lizard, and one skink, representing six families and six genera. Only two species were visually confirmed, namely the *Acanthocercus atricollis* Blue Headed Tree Agama and *Bitis arietans* Puff Adder. All encountered reptilian species are classified as least concern according to the 2020 IUCN Red List of threatened species.

Socio-economics:

A survey of the socio-economic state of the project area ascertained that the project site is located in Sebitoli KNP sector, within the gazetted protected area, in the vicinity of Sebitoli A village, Kaswa parish, Busoro Sub-county, Kabarole District. The survey also ascertained that the nearest community is located about a kilometer away from the site, settled at the boundary of KNP and along the Fortportal-Kampala road with both permanent and semi-permanent structures. The local communities are mostly engaged in farming and a number of them are employed in tea plantations and factories in the area and only a handful are engaged

in tourism related activities. One of the challenges faced by the community are animal raids which lead to loss of life and property. The survey ascertained that there are no socio-economic facilities (water sources, health & education facilities, markets etc) located within a kilometer from the project site. No private land take is expected during project implementation, as the proposed site is within the protected area. Direct positive impacts are expected to be enjoyed by the local community.

Stakeholder Engagement:

The points highlighted below represent the most frequently raised comments by various stakeholders, including national authorities, district local governments, and the local community:

- Depending on the price, the product might become popular which might lead to high numbers of tourists, which might also lead to disturbance of tourists who do chimpanzee trekking. It will thus be necessary to adequately plan the price of this product.
- The design should be that the facility structures blend well with the forest to avoid animals getting aggressive because of unfamiliar sites.
- The canopy walk should be integrated with other tourist products/activities so that tourists don't only go for the canopy walk but rather have other enjoyments like visits to restaurants and scenic sites to view (Rivers and valleys, etc). The local community could also be helped to develop a community ecotourism package which should also be marketed as part of activities within the Sebitoli sector.
- UWA should endeavour to see that the community benefits, perhaps by identifying ways of helping them start up eco-tourism businesses.
- UWA should develop an Emergency Response Plan, indicating a first aid plan, procedures for evacuation, referral to medical facility, and the program of training of workers in emergency preparedness.
- Considering that wood to be used shall be treated, how will potential pollution of water sources be mitigated? Storm water should be directed away from area water points.
- A major issue of concern for the community at the moment is animal raids, if that is addressed, then the community has no problem with the Park or any proposed activity.
- The design should consider closing the canopy top with a mesh so that animals like monkeys and chimpanzees don't walk on the walkway.
- In case manual labour is to be used and not machinery, then the local community should be considered.
- The canopy walk might not directly affect the local community positively; however, revenue from the increase in tourist numbers should be used to compensate those who were affected by animal raids (crops and lives).
- Continued sensitization of the community about tourism benefits should be done so that they appreciate the tourism sector.
- Local community should develop eco-tourism products which they can sell to tourists.

Potential environmental and social impacts:

Findings indicate that implementation of the Canopy walk project will lead to direct and indirect (revenue from community tourism operations) positive impacts which shall be accrued by the country as a whole through increased revenue as a result of increase in number of tourists.

The direct negative bio-physical impacts anticipated are mostly on KNP as an ecosystem and specifically the Sebitoli sector, while the socio-economic negative impacts (social cohesion due to interactions between project workers and local community, pressure on housing and social facilities due to increase in number of people in the area and insecurity) will be indirect and these will only occur if mitigation measures are not implemented. One anticipated major negative will arise if local communities fail to accrue any substantial benefits from the increase in number of tourists to the project area.

Some of the negative biophysical impacts identified and assessed by the ESIA team are;

- Disruption of ecological processes,
- Vegetation removal and loss of native species,
- Noise pollution,
- Disruption of wildlife activities which might lead to migration,
- Disturbance of nesting sites,
- Visual impacts,
- Impacts associated with increased human presence,
- Generation and poor management of solid waste.

Impacts have been assessed and discussed according to the different project phases and mitigation/enhancement measures have been proposed for implementation by different stakeholders.

Two plans have been developed to guide the implementer in implementing required mitigation measures. The plans specify the nature of the negative impact, the proposed mitigation measures, the indicators in the execution of these mitigation measures, the time period, and the responsible party for implementation and monitoring.

Conclusion & Recommendations:

In general, the proposed development will have limited negative impacts which can be managed with the proposed mitigation measures considering the location of the project site. The project has potential benefits as presented in the different sections. Two plans have been developed to ensure that the developments and operations are implemented in an environmentally and socially sound manner and restoration measures implemented at completion of construction and during operation.



Uganda Wildlife Authority (UWA) should ensure implementation of the Management and Monitoring Plans respectively.

If impacts not contemplated during this environmental and social impact assessment arise, UWA should immediately address them in consultation with NEMA and other lead agencies.

During Project implementation, the mitigation measures proposed in this ESIA are recommended to be implemented in order to ensure compliance to environmental and social safeguards. The implementation of the Plans would minimise the potential impacts and risks associated with the project.

1. INTRODUCTION

1.1. General Information and Background

Uganda's government secured funding from the World Bank for the implementation of the Investing in Forests and Protected Areas for Climate Smart Development (IFPA-CD) Project. The IFPA-CD initiative is a collaborative effort spearheaded and executed by the Ministry of Water and Environment (MWE) as the primary agency, in conjunction with the Ministry of Tourism, Wildlife and Antiquities, the National Forestry Authority (NFA), and the Uganda Wildlife Authority (UWA).

As part of IFPA-CD project, UWA proposed various tourism products within protected areas as a strategic approach. These proposals are part of the Albert Rift and West Nile component, specifically focusing on target protected areas (7 National Parks and 4 Wildlife Reserves). Thus, UWA proposed the Canopy Walk in Kibale National Park (CW-in-KNP) as one of her project components. This aims to address the escalating vulnerability of economic productivity, biodiversity, and livelihoods to the impacts of climate change. It further addresses heightened vulnerability which is attributed to the diminishing goods and services provided by park ecosystems, potentially affecting the planned canopy walk in KNP. In addition, the project will enhance the forest sustainable management and protected areas while maximizing the benefits derived from these natural environments in targeted landscapes, recognizing the need to diversify tourism offerings and improve visitor experiences in Uganda.

1.2. Uganda Wildlife Authority the proponent

Uganda Wildlife Authority (UWA) is one of the agencies under the Ministry of Tourism, Wildlife & Antiquities (MTWA). It is Uganda's Government agency responsible for managing and protecting Wildlife in and outside protected areas. The agency is supervised by the Ministry of Tourism, Wildlife and Antiquities. Currently it oversees the management of a diverse array of natural reserves, including 10 National Parks, 12 Wildlife Reserves, 5 Community Wildlife Management Areas, and 13 Wildlife Sanctuaries. Notable among these are Queen Elizabeth, Lake Mburo, Murchison Falls, Kidepo Valley, Kibale, Mount Elgon, Rwenzori Mountains, Semliki, Mgahinga Gorilla, Kibale National Park and Bwindi Impenetrable National Parks. These parks showcase the finest aspects of East Africa, with their Rift Valley landscapes and tropical forests providing captivating backdrops to a rich variety of flora and fauna. Kibale National Park

Kibale National Park (KNP) is one of Uganda's ten national parks overseen by the UWA. It is an integral component of the broader Kibale Conservation Area, encompassing KNP, Semliki National Park, Toro-Semliki Wildlife Reserve, and Katonga Wildlife Reserve.

According to the KNP General Management Plan (2015 - 2025), in 1993, the KNP was officially designated, consolidating the Kibale Forest Reserve (previously under the Forest Department's management) and the Kibale Forest Corridor Game Reserve (previously managed by the Game Department). Encompassing

around 795 km², it is situated 20 km East of Fort Portal town. The park is bordered by community lands dedicated to subsistence farming and expansive tea estates.

With current decentralization under government political borders with the districts of Bunyangabu in the south, Kamwenge in South East, Kyenjojo in the East, Bundibugyo and Ntoroko in the Northwest and Kibaale in the North east. The park has four authorized entrances, one is located at Sebitoli on the Fort Portal - Kampala road (where the Canopy Walk is proposed), while the remaining entry points are situated at Kanyawara, Kanyanchu, and Mainaro along the Fort Portal - Kamwenge Road.

1.3. The Rationale

Tourism is now one of the world's largest and fastest growing economic sectors that have profound implications on global economic, social, cultural and environmental aspects after the pandemic of 2019 – 2022 (Santos, 2023). Its expanding growth has considerable implications for the achievement of sustainable development especially in developing countries that rely on this sector for economic growth.

Uganda's tourism is much dependent on its abundant natural resources that make it one of the mega-biodiversity countries in the African region. A variety of ecosystems exist making Uganda one of "hotspots" of global biodiversity. One such important areas is KNP that has ecosystem interconnectedness with Rwenzori Mountains National Park in its North west, which is listed under the World Heritage Sites, and Queen Elizabeth National Park (QENP) in its South west, which is a Biosphere Reserve considered under the Convention of Biodiversity. Similarly, all these Protected Areas (PA) contain highest levels of biodiversity as categorized and classified by the International Union for Conservation of Nature (IUCN) in conservation and management terms.

The various economic reform measures undertaken by the Government of Uganda, especially in the implementation of National Development Plans (NDPs), have resulted in profound changes in the development of tourism. For example, Table 4-31 shows significant tourist numbers recorded in the recent years (with exception of an abrupt drop due to the COVID-19 pandemic).

Likewise, foreign visitors were estimated to be responsible for US\$ 805M of revenue earnings in 2011 (MTWA, 2020) later rising to UGX 2.7 trillion or USD 0.736 billion in 2022, equivalent to an increase of 41.4% of the country's service exports for the year and a sizeable 12.2% of all exports from the country (MTWA, 2023). In addition, a 2011 World Bank Situational Analysis report indicated that the Tourism sector accounted for US\$ 1.7bn around 9% of the GDP at that time, considering the induced and indirect impacts. The growth in the sector is reflected in other closely related sectors. The tourism industry provides excellent investment opportunities in the construction and management of hotels, lodges, and restaurants, infrastructure ventures, aviation projects, training institutions, tour operations, travel agencies, marketing organizations, financial and banking institutions, communication and information, agriculture, and health.

The cumulative effect of tourism development on a country's economy is therefore very significant because the sector for instance employed about 620,000 people in 2022 (MTWA, 2023) in activities directly related to tourism compared to 447,000 in 2011 (World Travel and Tourism Council, 2011). This increase was attributed to the implementation of various reform policies, increased marketing of Uganda's tourist attractions abroad, participation in various international tourism exhibitions, and the distribution of various flyers on tourist attractions through Uganda's embassies abroad, among other programs such as those implemented by Non-Governmental Organizations (NGOs). The government's overarching investment goal is poverty reduction in the country. This objective is supported by the tourism policy, aiming to increase the contribution of tourism earnings and GDP and improve Uganda's competitiveness as an international tourism destination.

Despite this increase, tourism in Uganda is still facing problems related to inadequate diverse tourism product development and quality infrastructure in some areas. Tourism products available in the protected areas for nature-based tourists are not sufficient in quantity and quality. It is for this reason that the Uganda Wildlife Authority (UWA) is increasing investments in various tourist facilities and products. With the above background, UWA is proposing to construct the Canopy Walk in Sebitoli in KNP, to add on the tourism products in the area and thus lead to increase in tourism numbers and tourism revenue locally, at district level, nationally and regionally.

A comprehensive environmental and social assessment is crucial for mitigating potential environmental and social risks associated with the Canopy Walk development, ensuring that the project aligns with national regulations and international standards.

1.4. Project Overview

The proposed Canopy Walk in Sebitoli sector of KNP is an exciting initiative aimed at enhancing the visitor experience and promoting ecotourism within the park. This innovative project involves the construction of a canopy walkway, providing visitors with a unique opportunity to explore the forest canopy at an elevated level. The walk is expected to offer breathtaking views of the forest tops in KNP, allowing visitors to have an aerial observation of wildlife and appreciate the diverse flora from a new perspective. The Canopy Walk is part of UWA's strategy to diversify tourism offerings within Sebitoli KNP, contributing to the sustainable management of the park. This development aligns with broader goals of conservation, environmental education, and community engagement. It is anticipated that the KNP Canopy Walk will attract nature enthusiasts, researchers, and tourists, thereby supporting both conservation efforts and the local economy. As a part of this initiative, an Environmental and Social Impact Assessment (ESIA) was undertaken, and an Environmental and Social Impact Statement (ESIS) prepared to ensure responsible and sustainable development in accordance with national and international standards.

1.5. Project Objective

UWA's tourism development strategy identifies the need to diversify the activities that tourists can enjoy within the parks and to create new sources of income generation. As part of this strategy, UWA wishes to explore the possibilities of a Canopy Walkway Tourism facility within KNP at Sebitoli sector to:

- Provide a new tourism experience
- Allow exploration and better understanding of the forest canopy
- Generate a new income stream.

1.6. Project cost

It is estimated that the project will cost **1,849,417 USD (One Million Eight Hundred Forty-Nine Thousand Four Hundred Seventeen United States Dollars)**.

1.7. Relationships to other Projects

The Canopy Walk project is intricately linked to the broader framework of Uganda Wildlife Authority (UWA) development projects, plans, and programs. Within the context of UWA's strategic initiatives, the Canopy Walk project aligns with the organization's commitment to diversifying and enhancing the tourism offerings within protected areas. This project is integrated into UWA's comprehensive approach to sustainable park management, conservation, and community engagement. There are various proposed investments included in the business plan that UWA is considering along with other partners aimed at promoting business in the parks. These include;

- Luxury tented camps and cottages
- House Boats, Cruise Launches on the Nile and Sport fishing on the Lakes Victoria, Albert, Edward and George
- Walking Safaris in the wilderness areas and the volcanic craters
- Canopy Walkways in tropical forests and sky trams
- Development of Lodges and other types of accommodation to suit the various categories of visitors
- Nature walks, game farming, game ranching and sport hunting on private property (private wildlife reserves)
- House boats and other water-based activities
- Mountaineering packages for Rwenzori, Elgon and Mgahinga Mountains
- Internal air transport services to the national parks and other domestic touristic hubs.
- White water rafting on the Nile
- Hot springs baths and supporting facilities

- Stop over facilities en-route to the national parks along major tourism circuits e.g. Kampala – Mbarara – Kasese – Mubende – Kampala; Kampala – Masindi – Gulu – Kitgum
- Despite the fact that the Canopy Walk project will be a complementary product to help UWA achieve its overarching goals, contributing to the overall development and promotion of ecotourism within KNP, it will serve as a valuable addition to UWA's portfolio of initiatives aimed at providing unique and enriching experiences for visitors while supporting the conservation efforts of the park.
- Furthermore, the Canopy Walk project is part of UWA's collaborative efforts with relevant stakeholders, including local communities and governmental bodies. It is designed to harmonize with UWA's existing and future development projects, contributing to the organization's vision for the responsible and sustainable management of Uganda's rich biodiversity and natural resources. The integration of the Canopy Walk project into the broader UWA framework underscores the commitment to fostering environmental stewardship, promoting tourism, and ensuring the long-term ecological health of Uganda's protected areas.

1.8. Environmental and Social Impact Assessment Process

The Environmental Social Impact Assessment (ESIA) process for the proposed Canopy Walk project complies with the stipulations outlined in the National Environment Act of 2019. Specifically, it adheres to the provisions in Sections 49(1) & (2), 113(1) & (2), 126(2), 176(1), 177(1) & (2)), of the Act. Importantly, the mandatory requirement for an ESIA for proposed canopy walkways is explicitly specified under Schedule 5, Section 10, Subsection (e) of the Act.

In Uganda, the Environmental and Social Impact Assessment (ESIA) is a systematic process that involves evaluating and predicting the potential environmental, social, and cultural effects of a proposed project or development. The typical steps involved in undertaking an ESIA are detailed in the National Environment (Environmental and Social Assessment) Regulations, 2020; the ESIA process and requirements are prescribed under Regulations 13 – 18. For example, a proponent is required to conduct scoping exercise; consideration of terms of reference by the Authority, Environmental and social impact study; and stakeholder consultation during the environmental and social impact study. Environmental and Social scoping for the project was undertaken and ToR were developed to inform ES due diligence. The Canopy Walk has had its Terms of Reference approved by the National Environment Management Authority (NEMA) see the (Appendix 1).

1.9. Project classification according to World Bank

The Bank classifies all projects (including projects involving Financial Intermediaries (FIs)) into one of four classifications: High Risk, Substantial Risk, Moderate Risk or Low Risk. In determining the appropriate risk classification, the Bank considers relevant issues, such as the type, location, sensitivity, and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; and the

capacity and commitment of the Borrower (including any other entity responsible for the implementation of the project) to manage the environmental and social risks and impacts in a manner consistent with the ESSs. Other areas of risk may also be considered relevant to the delivery of environmental and social mitigation measures and outcomes, depending on the specific project and the context in which it is being developed. These could include legal and institutional considerations; the nature of the mitigation and technology being proposed; governance structures and legislation in place; and concerns relating to stability, conflict or security.

Results from the environment and social (site away from the community) baseline and an assessment of the project scale (a 450-meter long elevated walkway in a relatively low biodiversity ecosystem) indicates that positive impacts outweigh the negative effects, thus placing this project in the moderate risk category.

1.10. Purpose of the Environmental and Social Impact Assessment

The purpose of the ESIA as provided in part X of NEA, No.5 of 2019, Section 110 sub section(s) 1 – 2, is to evaluate environmental and social impacts, risks or other concerns of a given project or activity, considering the environmental principles set out in section 5(2) of the Act. However, the Environmental and Social Impact Assessment (ESIA) is undertaken to identify and assess the potential environmental and social impacts of the proposed project and propose mitigation measures and management actions to avoid or minimize the negative impacts. Thus, ESIA findings are used to guide decision makers to understand the environmental and social consequences of the proposed project to facilitate the protection, restoration and enhancement of the environment and socioeconomic setting of the project area.

The assessment and its findings are proportionate to the identified risks and impacts of the proposed and it informed the design of the Canopy Walk project and has identified mitigation measures and actions to inform decision making.

1.11. Objectives of this EIA

The main objective of this ESIA is to identify, predict, and evaluate the potential impacts of the proposed development of the Canopy Walk (CW) in KNP. This includes recommendation of mitigation and/or enhancement measures for incorporation into the designs, and for implementation during the construction, operation, and decommissioning phases of the CW to ensure project sustainability with the least negative impact on the social, economic, and ecological environment. The specific objectives of the ESIA for the proposed Canopy Walk are;

- i. Describe the project activities that will be undertaken during the construction and operation and maintenance phase of the project.
- ii. Review national, World Bank and other relevant international policies, legal, regulatory, and administrative framework relevant to the development of the project.

- iii. Evaluate project options and advise on the most appropriate option considering a combination of environmental and social considerations.
- iv. Document existing environmental and social baseline information in the project area and their surrounding areas.
- v. Conduct project public consultations of all relevant stakeholders and document their concerns regarding the proposed project; and incorporate these into the project design where appropriate.
- vi. Identify and assess the potential environmental and social impacts and recommend appropriate mitigation strategies (avoid, minimize, restore and compensate) to address such impacts.
- vii. Prepare an Environmental and Social Impact Statement with an Environmental and Social Management and Monitoring Plan (ESMP) and define the institutional structure to guide the implementation of the ESMP.
- viii. Provide a set of recommendations for the project design to avoid and/or minimize the negative impacts and maximize the positive impacts of the project.

The assessment also considered the following.

- Source and cost of construction materials.
- Compatibility of project within KNP, sectoral, national international policies and conventions
- Costs and benefits to UWA, the local community, the nation and at international level
- Potential impacts of the project on the surrounding biodiversity and vice versa.
- Environmental Management and monitoring issues related to the project etc.

In addition, the assessment aimed at undertaking studies proposed in the World Bank Terms of Reference for Environmental and Social Impact Assessment of the proposed Canopy Walk in Kibale National Park

1.12. Considerations

The approval of the Terms of Reference (ToRs) by the National Environment Management Authority (NEMA) provided in Appendix 1 and World Bank Terms of Reference for Environmental and Social Impact Assessment of the proposed Canopy Walk in Kibale National Park, guided the Environmental and Social Impact Assessment (ESIA) and the preparation of the Environmental and Social Impact Statement (ESIS). The study commenced with a scoping exercise, aimed at determining the scope of the ESIA and boundaries of the investigation. Specifically, the scoping phase involved the following activities:

- Determination of spatial, temporal and institutional boundaries of the project;

- Identification of main problems, constraints and issues associated with the project;
- Identification of the likely positive and negative impacts of the project;
- Identification of stakeholders and their concerns;
- Identification of project alternatives;
- Identification of data requirements

In considering project alternatives, special attention was given to what would happen without the CW-in-KNP. This information is useful in determining what the impacts of the Canopy Walk would be if the project is not developed or if it is developed and what alternatives need to be considered. The ESIA provided an opportunity to identify and involve relevant key stakeholders likely to affect or be affected by the project within Uganda, bearing in mind the importance of Kibale Conservation Area and its closest conservation areas.

1.13. NEMA Terms of Reference approval conditions

Table 1-1 below presents how the ESIA has complied with the NEMA approval of terms of reference (as per the letter of approval of the ESIA ToR appended to Appendix 1).

Table 1-1: NEMA Terms of Reference Approval conditions

No	Condition	Compliance/Response
i.	Provide a comprehensive description of all proposed project components and activities covering both the construction and operational phases of the project and the size of the workforce.	Chapter 2 describes all proposed project components and phases.
ii.	Provide a detailed description of the various potential sources, including the method of handling, containing and disposing of the different streams of waste and measures for controlling pollution of air, water and land in KNP.	Waste management has been presented in section 2.13, while water and land protection measures have been proposed in section 7.6.
iii.	Ensure that the ecological setting, movement and breeding patterns of all animal and bird species are not affected/alterd by the project operations and activities. The project activities should not lead to loss of biodiversity or affect the movement of animals in the national park.	Measures to ensure minimal effects to biodiversity have been proposed in sections 7.5 and 7.9.
iv.	Put in place mechanisms to ensure that noise generated at the project during construction and operation phases of the project does not exceed the levels stipulated in the National Environment (Noise Standards and Control) Regulations, 2003 as this may affect breeding patterns of animals.	Noise mitigation measures have been proposed in section 7.6.4. and 7.10.2 for the construction and operation phases respectively. These measures are also captured in the ESMP (Table 11-1 and the monitoring plan in Table 12-1.
v.	Provide a detailed assessment of health and safety aspects associated with the proposed project and the respective mitigation measures; the walkway routing, construction, site selection should put into consideration	Safety measures have been described in chapter two (2.8) and chapter seven (7.7.6, 7.9.7, 7.10.4, 7.10.5, 7.10.9 and

No	Condition	Compliance/Response
	the health and safety of the users. More again, provide insurance for the workers since the project involves the risk of wildlife/animal attacks.	7.11.6) and the management plan (Table 11-1).
i.	Materials lifespan analysis should be undertaken to determine how long it will take before any parts of the canopy walk are replaced/repared.	Lifespan analysis has been provided in section 2.5.
i.	Provide coloured Google maps that are clear and well labelled (Preferably each covering A-4 or larger paper size), and GPS coordinates in a UTM system for the proposed project area clearly showing the neighbouring environs as well as coloured photographs depicting the current status of the project area clearly showing the neighbouring environs as well as the distance from any sensitive ecosystems.	Maps have been presented in chapter 2 and chapter 4.
i.	Provide current baseline data of the project area, including but not limited to biodiversity and how it may be impacted by the project activities taking note of key bio indicators to ecological stress within the area.	Baseline data has been presented in chapter 4.
k.	Provide a well labelled and legible copy of the proposed site layout plan that shows the areas of sensitivity such as swamps, rivers, streams and shows how their integrity will be preserved.	A plan, sketches and artistic impressions are presented in section 2.3. Section 4.3.9 presents a map of water points in relation to the project site.
k.	Carry out comprehensive consultations with all the relevant stakeholders and Lead Agencies including among others, the National Forestry Authority (NFA), the Ministry of Tourism Wildlife and Antiquities (Department of Occupational Safety), and the Department of Environmental Affairs under the Ministry of Water and Environment; the Occupational Safety and Health Department (Ministry of Gender, Labor and Social Development), Uganda Tourism Board, Kabarole District Local Government, and the LC1 leaderships of Sebitoli A and B, Mugusu A and B and Kanyakuru villages and the respective surrounding local communities. Ensure that the stakeholder views/concerns related to the project development are well documented and included in the ESIA report.	Chapter five presents results of engaging different stakeholders and attendance registers are attached in Appendix 3 (a).
i.	Carry out a comprehensive evaluation of all negative environmental impacts associated with the proposed project activities and the relevant mitigation measures to minimize the identified negative impacts; and provide detailed environmental management/monitoring plans (preferably in table matrix format), to cater for the	All negative environmental impacts associated with the proposed project have been analysed in chapter 7. Mitigation measures have been tabulated in chapters 11 and 12.

No	Condition	Compliance/Response
	environmental impacts from the proposed project activities.	
i.	Carry out detailed evaluation of alternatives /options to the project design and site selection, among other aspects and a justification for selecting the chosen option.	Alternatives have been assessed in chapter 6.
i.	Avoid vegetation and other fragile clearance while creating ways for transportation of materials for the project and project plant species that are palatable for primate species and other big mammals that are arboreal and terrestrial such as chimpanzees, monkeys and forest elephants as this may affect behaviour and breeding.	Protection of the ecosystem has been proposed in chapter seven.
v.	Append to the ESIA report authentic copies of land acquisition and ownership documents or relevant authorization to utilize the land for the said purpose.	No land acquisition will be undertaken since the proposed site is located in KNP which is under UWA jurisdiction.
v.	Consider any other critical environmental aspects/concerns which may have not been initially foreseen during the preparation of the scoping report and TOR, and include an evaluation of such environmental and social concerns in the ESIA report	Basing on the environmental and social set-up of the project area and comments raised by stakeholders' critical environmental aspects have been assessed and mitigation measures proposed.
i.	Further, in accordance with Regulation 18 (1) of the National Environment (Environmental and Social Assessment) Regulations, S.I No. 143/2020, submit to this Authority the estimated cost of the project evidenced by a certificate of valuation of the capital investment of the project, issued by a qualified and registered valuer	
i.	In compliance with regulation 49 (2) of the National (Environmental and Social Assessment) Regulations 2020, you are required to make payment of a non-refundable administration fee of 30% (thirty per cent) of the total ESIA fees payable on submission of the environmental and social impact statement.	
i.	The Authority finally guides that only registered Environmental Practitioners, including the team leader should be contracted to carry out the ESIA studies for the proposed project.	The ESIA was undertaken by registered and certified Environmental Practitioners.

1.14. Structure of the Environmental and Social Impact Statement

The structure of the Environmental and Social Impact Statement (ESIS) that is presented in Table 1-2 below follows Schedule 5 of the National Environment (Environmental and Social Assessment) Regulations, 2020 and the Guidelines for Environmental Impact Assessment in Uganda (NEMA, 1997).

Table 1-2: Structure of the ESIS

Chapters	Title	National Environment (ESA) Regulations (2020) Requirements (Schedule 5)	EIA Guidelines for Uganda (NEMA, 1997), Guideline 4.1.1.3
	Cover page	1. Cover page of the ESIS shall have— (a) Title of the proposed project. (b) Location of proposed development. (c) Name, address and contact information of the developer. (d) Date of submission	
	Preliminary pages ESIA project team, Executive summary, Table of contents, Acronyms.	2(a) Declaration sheets signed by all the environmental practitioners who undertook the environmental and social impact study. (b) Executive summary. (c) Acknowledgement. (d) Acronyms. (e) Details of the environmental practitioners who undertook the study, including their names, contact details, and areas of expertise.	A precise and non-technical summary describing only significant results and recommended actions
Chapter 1	Introduction	3 (a) A description of the proposed project, including the name, purpose and nature of the project. 3(f) The projected costs of the project evidenced by a certificate of valuation of the capital investment of the project issued by a qualified and registered valuer.	Project description including name/title, purpose/nature, objectives, scale and activities during different phases of the proposed project.
Chapter 2	Description of the Proposed Project	3(c) The proposed location and physical boundaries, including maps and coordinates, and photos, of the project clearly showing the projected area of land or area that may be affected by the project activities, or, if it is— (ii) an activity in a water body, the coordinates within which the activity is to be undertaken. (e) The design of the project and any other project related components, including the activities that shall be undertaken and a description of the major material inputs to be used during construction or development and operation of the project.	

Chapters	Title	National Environment (ESA) Regulations (2020) Requirements (Schedule 5)	EIA Guidelines for Uganda (NEMA, 1997), Guideline 4.1.1.3
		3(g) The size of the workforce.	
Chapter 3	Policy, Legal, Regulatory and Institutional Framework	3(h) A description of the manner in which the proposed project and its location conform to existing laws and standards governing such projects, including a reference to relevant plans required under the Physical Planning Act, 2010.	Environmental Policy, legislative and institutional framework
Chapter 4	Environmental and Socio-economic Baseline	3(j) Baseline conditions of the physical, biological and socioeconomic environment of the project area, including results of relevant studies and other geophysical and geotechnical studies.	Description of proposed project site including spatial and temporal boundaries within which the project is planned, the physical, biological and human environment, current land-use and any sensitive areas.
Chapter 5	Stakeholder Engagement and Disclosure	3(s) Evidence of stakeholder consultation, including how the stakeholders were involved.	Public and agency comments and responses thereto.
Chapter 6	Analysis of Project Alternatives	3(d) An evaluation of project alternatives, including a zero or no project alternative in terms of project location, project design or technologies to be used, and a justification for selecting the chosen option.	Project Alternatives
Chapter 7	Impact identification, Analysis and Evaluation	3(k) An assessment of potential environmental, health, social, economic and cultural impacts of the project and their severity, and the proposed mitigation measures to be taken during the preconstruction, construction, operational and decommissioning phases of the project. 3(l) proposed mitigation and preparedness measures for potential undesirable impacts that may arise at project implementation but were not contemplated at the time of undertaking the environmental and social impact assessment. 3(m) An assessment of climate- related impacts associated with the project, including potential climate benefits and carbon footprints of the	Significant environmental impacts and risks. Mitigation measures focusing on achievable, pragmatic, environmentally feasible and cost-effective mitigation measures

Chapters	Title	National Environment (ESA) Regulations (2020) Requirements (Schedule 5)	EIA Guidelines for Uganda (NEMA, 1997), Guideline 4.1.1.3
		proposed project, as well as the potential vulnerability of the proposed project or activity to climate change, and the proposed adaptation and mitigation measures. 3(p) An assessment of the residual impacts, and proposals for offsets and other compensation mechanisms.	
Chapter 8	Risk Assessment	3 (q) An assessment of the environmental risks, where required. Part V (36), (1) The developer required to undertake environmental risk assessment shall carry out a risk analysis to identify the high-risk areas and high-risk operations of the project or activity to ensure that measures are put in place to adequately address the risk or hazard.	Significant environmental impacts and risks. Mitigation measures focusing on achievable, pragmatic, environmentally/health and safety feasible and cost-effective mitigation measures
Chapter 9	Cumulative Impact Assessment	3 (o) An assessment of the secondary or cumulative impact of the project and associated activities.	
Chapter 10	Decommissioning	NEA, 116 (1)	
Chapter 11 and 12	Environmental and Social Management and Monitoring Plan	3(r) A detailed environmental management and monitoring plan incorporating a climate adaptation and mitigation plan	Monitoring and evaluation programme and recommendations
	Conclusion and Recommendations	2 (f) (iii) summary and conclusions	-
	References	2(g) a reference list detailing the sources used for the descriptions and assessments included in environmental and social impact statement;	Bibliography and literature review
	Appendices	3(b) Approved terms of reference.	Technical appendices Records of stakeholder engagement List of stakeholders consulted or engaged Terms of reference Other technical information and data as required

2. PROJECT DESCRIPTION

2.1. The Nature of the Project

Uganda Wildlife Authority (UWA) aims to boost and diversify revenue sources from KNP's Sebitoli Tourism Sector by introducing other tourist products among which are the Canopy Walk. The proposed canopy walkway, spanning 450m in length and 1.4 meters in width, along with a 27-meter-high lookout tower, is intended to enhance tourists' experience in KNP, thereby contributing to increased revenue for UWA. Notably, the construction of the Canopy Walkway is planned meticulously to avoid felling trees during the establishment and decommissioning in the area, ensuring minimal disruption to the park's biodiversity.

2.2. Location

KNP is positioned 20 kilometers to the east of Fort Portal City in Western Uganda. The proposed site for the development of a Canopy Walk falls within the Sebitoli Tourism Zone situated at the northern most part of the park, along Kampala-Fort Portal Road. Recognized as a primate capital, KNP holds a distinguished reputation as a significant tourist destination.

The project location is situated within the Sebitoli Tourism Zone within the gazetted boundary of KNP, specifically in the vicinity of Sebitoli A Village, Kaswa Parish, Busoro Sub-County, Kabarole District, and can be accessed through the Sebitoli UWA Park Visitor Center Gate, located along the Kampala - Fort Portal Road. Additionally, the geographic coordinates for the Sebitoli tourism zone range from 0°13' to 0°41'N and 0°19' to 30°32'E. The park's Sebitoli zone is surrounded by villages, that directly adjoin KNP being Sebitoli A, Sebitoli B, Mugusu A, Mugusu B, and Kanyakuru in Kabarole District. The districts bordering KNP include Kyenjojo to the North-East, Kamwenge to the South, Ntoroko to the North, Kasese to the South West and Bunyangabu in the West.

The entire Northern Sebitoli Zone is bordered by tea estates, serving as the primary economic and livelihood activity for the local communities. Residents engage in various tasks within the tea plantations, such as harvesting, pruning, and caretaking, contributing to the labor force in multiple ways. Figure 2-1 to Figure 2-5 below demonstrates the strategic location of the project site in Kabarole, Uganda and Africa as a region.

The land requirement for canopy walk is approximately 3.14 Acres of land near the existing Sebitoli park administration offices.



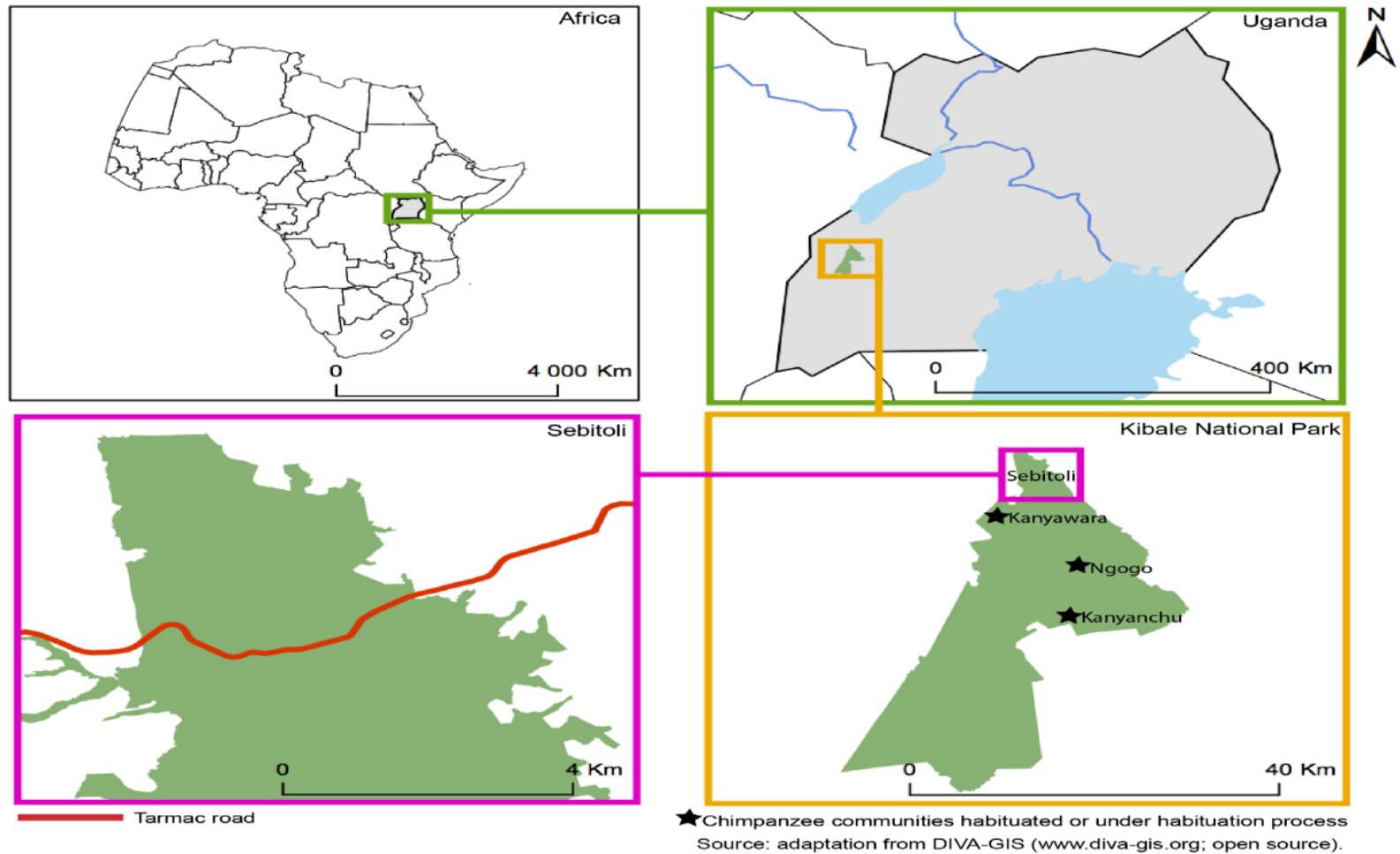


Figure 2-1: Sebitoli Sector in relation to Africa and Uganda

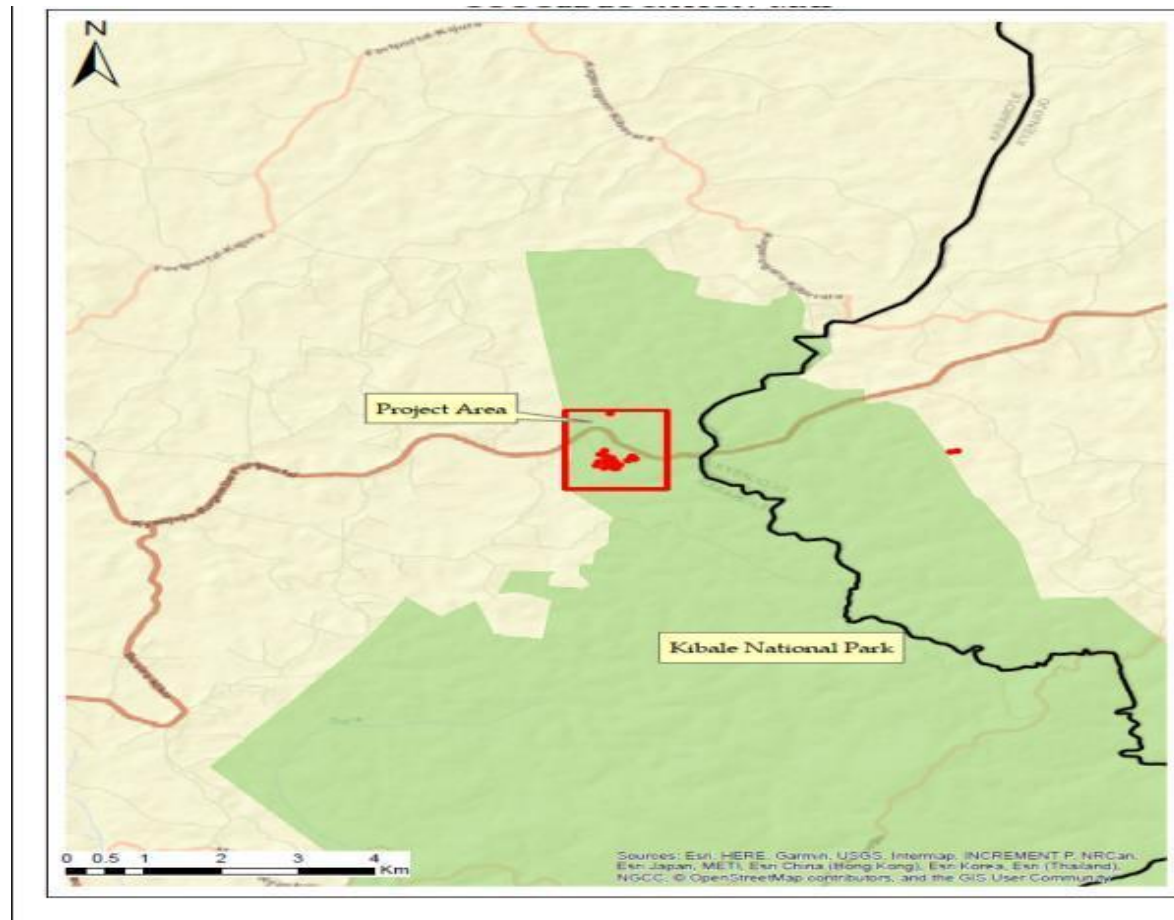


Figure 2-2: Location of the proposed canopy Walk in Sebitoli Tourism Zone of KNP

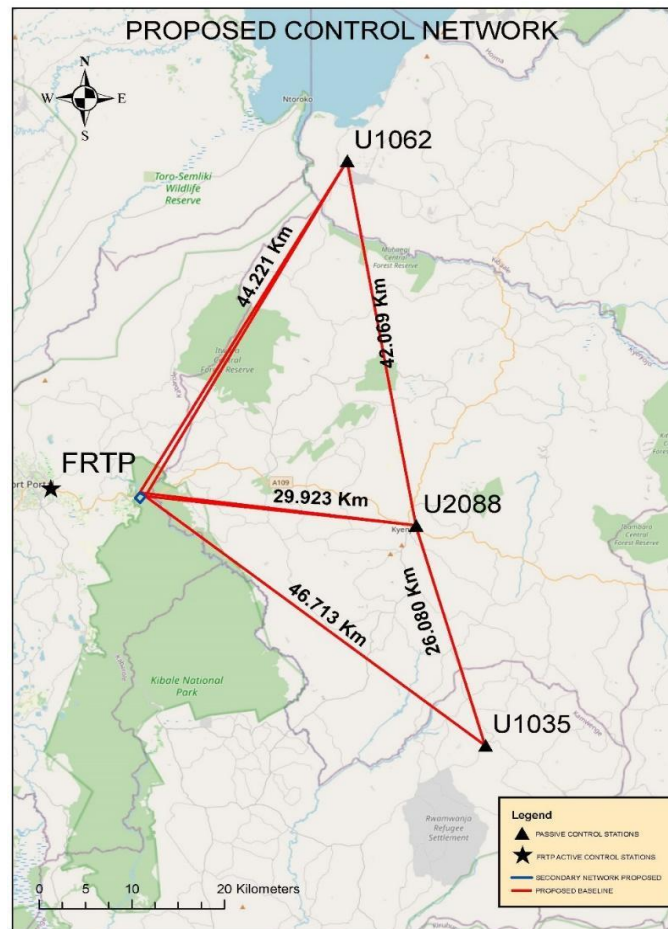


Figure 2-3: Proposed Control Network for the canopy walk



Figure 2-4: Show KNP and Districts bordering the Park

Source: *Open steep Map*



Figure 2-5: Location of Sebitoli Tourism Zone at the northern tip of Kibale National Park

Source: www.ugandawildlife.org

2.3. Project Area of Influence

By description, a Project Area of Influence (PAI) is the geographical region or zone where a projects' activities, negative and positive outcomes are expected to have a direct or indirect impact on the environment, communities and stakeholders. There is a Direct Project Area of Influence and an Indirect Project Area of Influence.

For this project the direct area of influence is 200m radius around the project site including the existing access road to the site, whereas the indirect area of influence, covers the rest of KNP, Sebitoli Village, Kaswa Sub-County, Kabarole District and Uganda at large (revenue to be collected-directly and indirectly).

2.4. Design Concept

The chosen location for the 450m long canopy walkway and lookout tower encompasses approximately 3.14 acres (equivalent to about 12,732m²) of land. It is crucial to emphasize the significance of identifying key points, marked as X1 and X 2, which serve as the optimal starting and ending points for the initial segment of the Canopy Walk project. The foregoing set the reasons for the choice of this site for proposed canopy walkway based on:

- Close proximity to existing access road, administration facilities parking area and services
- Far enough away from the A109/Mubende/Fort Portal Road and on the other side of a ridge that cuts off the traffic noise.
- Ideal consistent sloping ground
- Numerous giants well established forest trees
- Excellent view potential out from mid-way into the canopy

The design strongly supports for the refurbishment of the current facilities to incorporate amenities such as restrooms, a ticket office, a reception, a conference room, and a waiting area. These facilities are essential as supplementary support for the proposed canopy walk. Interestingly is that the design concept for the Canopy Walkway draws inspiration from the 'Python,' one of the known organisms in the forest habitats of KNP. The walkway is configured in the shape of the python, adopting its sinuous elements, as illustrated in the figures 2-7 – 2-9 below and detailed in the proposed architectural designs.

From the start, the walkway gradually ascends, and, as it approaches the destination, it flattens out, providing a level surface as the forest floor descends, allowing visitors to enter the forest canopy at an elevation of approximately 16m above the ground. Towards the end, the walkway broadens and incorporates benches for siting, inviting the onboard persons to relax and appreciate the natural beauty of the forest interior biodiversity high above in the forest canopy. At this point, visitors will have covered about 120m from the

parking and reception area, following a solid ground path (yet to be established), and an additional 300m (from Column1) on the elevated canopy walk.

The walkway will have a width of 1.4m, ensuring easy passage for pedestrians, and it is equipped with regulatory balustrades on each side, measuring 1.1m in height. Its starting point is at an elevated position in the forest (designated as point X1 in the survey), near the current administration facilities at Sebitoli within KNP. The canopy design incorporates expansive lookout points, each measuring 2.8m in width, as illustrated in the drawings below (Figure 2-6 to 2-8).

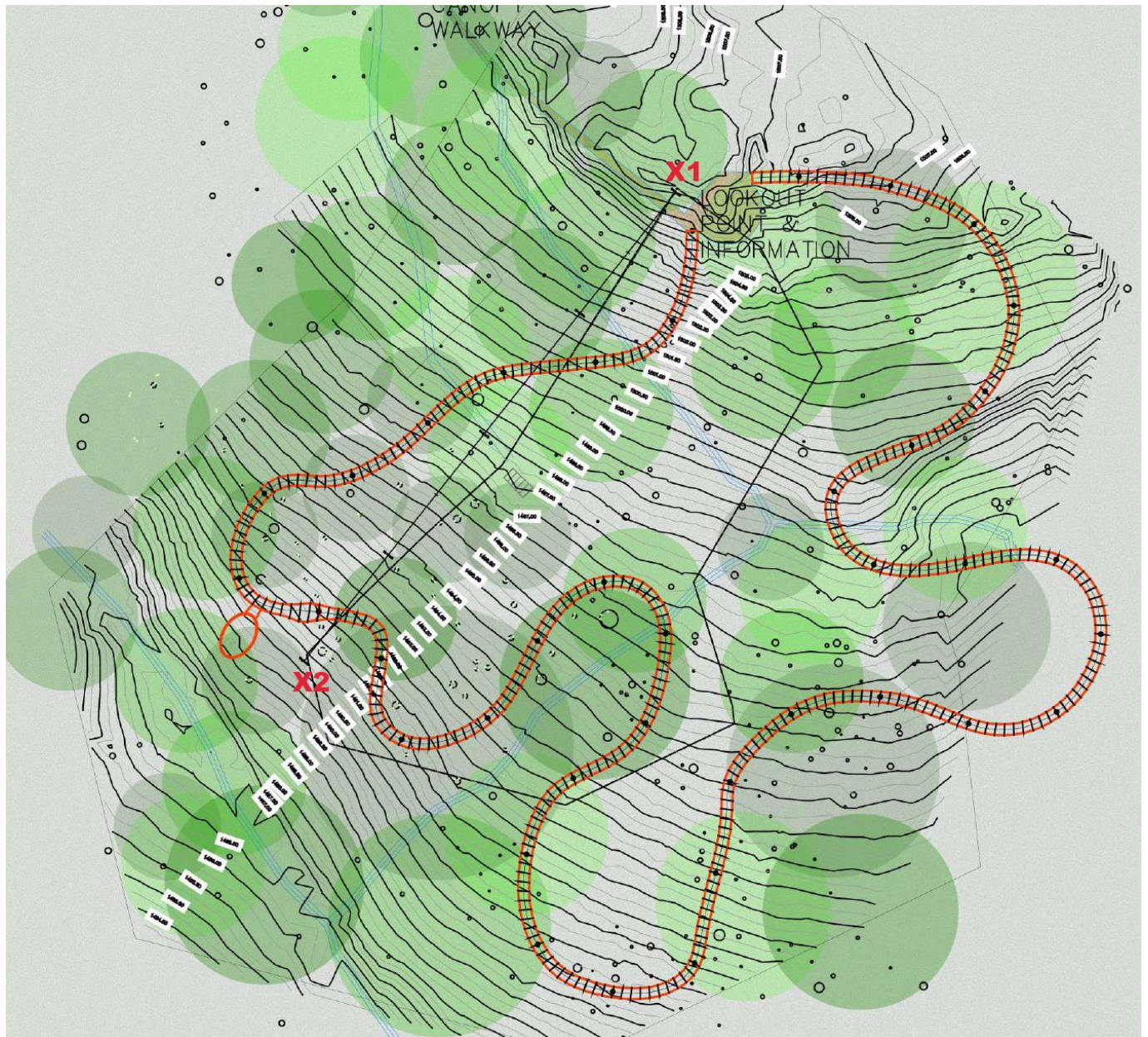


Figure 2-6: Selected option of the canopy walk



Figure 2-7: Canopy Walkway route design options.



Figure 2-8: Site plan for the proposed canopy walkway

Additionally, the lookout tower, standing at a height of 27m is linked to the starting point (Column 1) at a distance of 96m. Persons on board have the option to ascend two additional levels to reach a summit outlook platform situated 24m above the forest floor. This upper platform features a state-of-the-art UV-resistant stretch fabric cover, providing rain protection for this level and the two platforms below. The layout of these platforms is oval-shaped, with a sculptural spiral staircase connecting the various levels. The tower stands independently as an observation tower, supported by a central column structure. The descriptions in figure 2-9 – 2-10 provide an internal and exterior understanding of the proposed establishment.

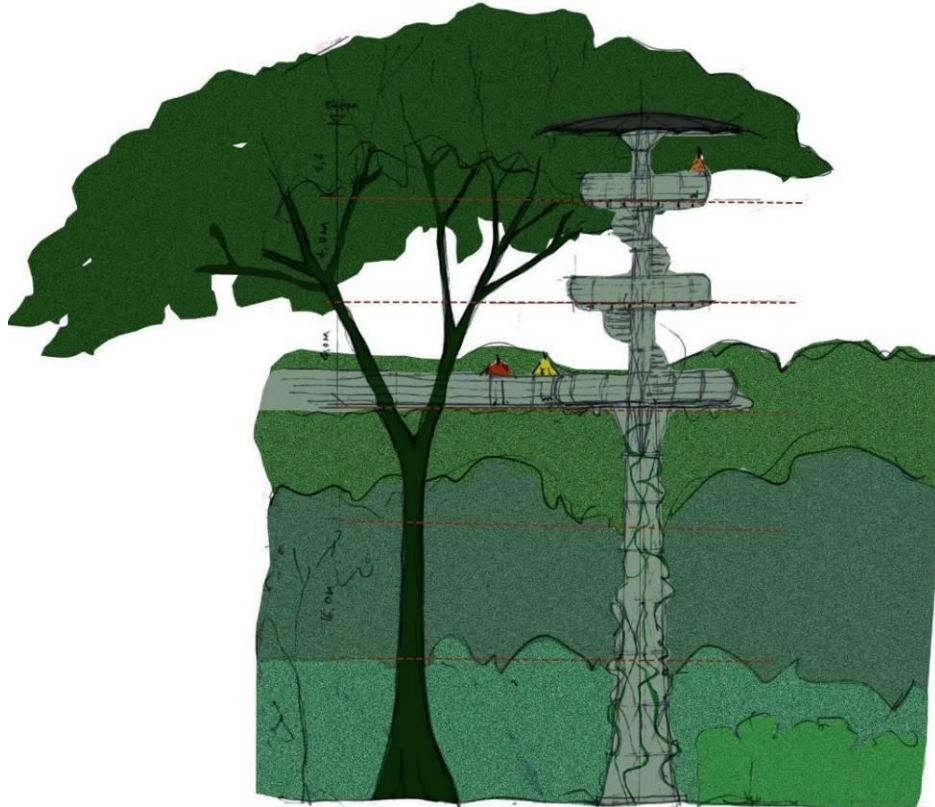


Figure 2-9: Sketch indicating the height intervals of 4m after ground leveling at 16m from point X1



Figure 2-10: The developed artistic impression of the tower and main canopy walkway

2.5. Materials to be used

Regarding lightweight spanning, steel has been selected as the most suitable structural material. The lengths of the components have been designed with consideration for weight and ease of handling. All components shall be pre-manufactured offsite and galvanized plus 4 coats of epoxy for subsequent bolted assembly on-site. All hot dip Galvanized steel components shall be etched and washed to achieve salt levels below 50mg/m².

The walking surface itself will be crafted from locally sourced hardwood with a rough-sawn finish, thicker than typical decking materials, to enhance durability. The narrow design of the hardwood slats aims to minimize slipperiness, especially in damp and wet conditions, ensuring a safer walking experience.

The handrails/lean rails shall be made of continuous molded rubber smoothly fitted onto the upper steel member at a height of 1100 mm above the deck level. The curved baluster ribs are precision-cut from steel plate and assembled in 1.2m component lengths. They incorporate a lightweight stainless-steel safety mesh measuring 40 x 40 mm, with stainless ferrules securely affixed between horizontal 16mm round steel bars, positioned 100 mm from the top and bottom. The design does not include any anticipated services or lighting. The walkway commences and concludes adjacent to uncomplicated concrete wall abutments. Foundations for the columns are buried reinforced concrete footings, with all excavations by hand under control of the appointed environmental control officer. Reinforced concrete stub columns extending from the footing below the ground to about 300 mm above ground level, where the steel columns will be bolted onto them. Other artistic impressions of the proposed Canopy walk in Figure 2-11 – 2-13 as seen below:



Figure 2-11: Connection of the railing onto the main spine or main curved steel beam



Figure 2-12: Canopy walk supported at 12m intervals



Figure 2-13: View of the canopy walk from Point X2 towards X1

2.6. Lifecycle of materials

If constructed with sufficient concrete cover over the reinforcing steel, the concrete elements, including foundations and stub columns, are expected to endure for a century without requiring any maintenance. The longevity of the structural steel components is contingent upon preventing corrosion. To ensure this, the proposed design for the Canopy walkway prioritizes high-quality corrosion protection for the steel. This involves measures such as hot-dip galvanizing along with the application of four coats of epoxy. To maintain optimal conditions, all hot-dip galvanized steel components will undergo etching and washing to achieve salt levels below 50mg/m². Despite these precautions, we recommend a careful examination of the steelwork every 5 years.

The lifespan of the timber components is closely tied to the type of timber selected. For this project, the proposal is to use locally sourced hardwood, preferably obtained from the vicinity of the proposed site. Proper treatment will be administered to ensure an extended lifespan of over 15 to 20 years. For aesthetic reasons, the client or canopy walk manager may choose to periodically oil the timber slats. While the walkway is not expected to necessitate a regular maintenance program, it is advisable to conduct thorough checks every 5 years.

2.7. Material choice justification

Concrete is selected for foundations and stub columns because of its ease of pouring into foundation excavations, its strength when properly designed, and its durability and cost-effectiveness. Steel is chosen as the primary structural material for its economic advantages and the ability of delicate sections to span considerable distances, thanks to the inherent strength of steel. Timber is employed for the walkways due to its cost-effectiveness and its capacity to impart a sense of warmth, esthetically blending in with the

surrounding and creating a visual contrast with the steelwork. Rubber is opted for the handrail covering to achieve both economy on a curved shape and strength and longevity. It is expected to have a 20-year lifespan and is easily replaceable.

2.8. Canopy Walkway height justification

The feasibility study team ascertained from literature that it is generally more interesting to walk at a level between the treetop canopies where one can see and enjoy the flora and fauna, rather than above the trees. However, it was also realised that it is good to have some points with a long view over the forest. For this reason, the design team proposed raised lookout decks. There is a maximum comfortable slope for the walkways, so it would in any event not be easy to get the walkway to a higher level. It was for this reason that the team looked for a site where the ground slopes away from the walkway below.

At the start, the walkway gently rises and near the destination point, it levels off as the forest floor drops below, bringing visitors into the tree canopy at a height of about 16 metres above the ground.

2.9. Health and safety considerations

According to the designers of the canopy walkways for the Kirstenbosch, South Africa, the Viper tree canopy walkway in the UK, the Illawarra treetop walk in Australia and the Neckartal treetop walkway in Switzerland, there is no evidence of any harmful effects on animals resulting from the establishment of canopy walks. As a result, there are few anticipated negative impacts.

For tourists, the design of the canopy walk provides inclusive opportunities, accommodating people with disabilities, whether or not they use a wheelchair. The railing is designed at a height of 1.1 meters, with intermediate bars measuring 16mm in diameter and fitted with 40x40mm chain links. The rail design has also been proposed to minimize likely risks of falling from the canopy walk.

The structural design of the canopy is robust and resilient, capable of supporting considerable weight, such as that of an elephant, (in reference to the fear of likely collapse of the walkway due to weight). Still on the safety of tourists, the canopy walk floor shall be made with material that is not easily affected (slippery/ susceptible to mold growth), hence ensuring protection of the users.

It has been proposed that management shall ensure no presence of animals on the canopy walk before tourists utilise the canopy walk.

2.10. Construction and operation Phases

To finalize the engineering foundation designed a geotechnical survey will be carried by UWA. Thereafter a report will be shared with UWA and the financiers for clearance according to the operating procedures that will be required then.

Assumptions are that once the forest route has been mapped out, a geotechnical survey and subsequent report will become necessary. This geotechnical report must detail the permissible foundation bearing pressures at every column and abutment location, along with information pertaining to excavation safety.



Given the likelihood of excavations needing to reach depths exceeding 2 meters, this is to ensure that the foundations rest on stable material that won't shift. Adequate backfill soil can be applied on top of the footings to prevent them from being toppled over.

The steel components will be pre-manufactured and subsequently assembled on-site, resembling a Meccano set, thereby mitigating the risk of steel waste spillage. This assembly approach will also be applied to the timber pieces used in constructing the walkway. Anticipating minimal impact on the flora and fauna, we envision that galvanizing and painting processes will be completed before transporting the structures to the site. This will be conducted under the supervision of the contractors' Environmental Officer, who will be guided by the supervising consultant.

For concrete, precautions will be taken to prevent any spillage on-site or during transportation.

Attention will be paid to the route, such as the mixing area at the camp. Plastic sheeting will be placed in the foundations to prevent cement leaching into the ground during base excavations. All excavations will be manually executed, and the transportation of materials will be handled using wheelbarrows within carefully demarcated work zones. Vehicles will not be permitted in the forest area, and the maximum width of any mobile crane used will be limited to 1.6 meters. The operation will be better described by the successful bidder of the construction.

2.9.1 Reinforced Concrete Foundations, Stub Columns and Abutments

Reinforced concrete bases will be employed for the columns, abutments, and the tower. The anticipated foundation soffit level is approximately 2m below the surface at each column. The following assumptions were considered for costing purposes.

- 500 mm thicknesses Column bases. The actual base sizes will vary, depending on the results of the geotechnical report and on the height of each column, an average base size of 2.5 x 2.5m in plan for the columns was considered as indicated in the structural drawings
- A tower base size 4.5 x 4.5metre was considered in the costing of the tower. For 2 abutments, a base size of 2m x 5m was assumed
- Allowance for reinforced concrete stub columns of 640 mm in diameter and 1.6 m high for each of the columns was considered by the Quantity surveyor. It is also important to note that the actual diameters shall vary because of the actual column heights
- Allowance for 400mm wide walls, 5m long and 1.5m high was also considered for the two abutments
- For all the concrete use, a 35 MPa concrete strength, with a high slag content in the mix was considered for cost estimates
- On average, reinforcement in the concrete 110 kg/m³ was considered in the cost estimates

Once all the columns are fitted, the excavated soil shall be filled back on top of the bases and inside the tower rings up to the original ground level and reinstate natural vegetation.

2.9.2 Columns

Each steel column consists of a central Circular Hollow Sections (CHS) –pipe section 219 x 6. Around this, are 6 no 32 mm evenly spaced steel rods. They are close to the CHS at the top and their offset from the CHS gets bigger towards the bottom, as the moments increase. The baseplate diameter will thus depend on the height of the column. If required a detail can be designed for junctions in the longer columns, to have shorter sections for galvanizing, transport and erection on site. The column bases will be bolted onto the reinforced concrete stub column with 6 no M20 hot dip galvanized graded 8.8 bolts epoxied 400 mm deep into the concrete. At the top of the column it will be bolted to a triangular bracket welded to the soffit of the superstructure main beam, as shown on the drawing. The columns are to be placed at approximately 12-meter intervals, with the end spans.

2.9.3 Bridge Superstructure

All the structural members are to be pre-assembled in the fabricator's workshop, so that everything will fit perfectly when erected on site, with no on-site welding. The main load bearing member is a welded-up box section with a total depth of 260 mm and a width of 162 mm. The top plate overhangs the side plates and is 250 mm wide. The proposal is that these beams be built in sections, each with a length of half the span between columns, i.e. about 6 m in length, with junctions at the quarter span points. The plan layout of the bridge will be mostly curved and thus the top and bottom plates are laser cut from 10 mm and 16 mm thick sheet respectively. The side plates can be bent from 250 x 6 mm flat steel sections.

Onto this, spine beam transverse bearer members are to be bolted, spaced at 1.2 m centers. These beams are 80 x 40 x 3 RHS (rectangular hollow sections). They have baseplates welded to their soffit at mid span for bolting onto the spine beam. These members can all be identical. To the left and right ends of these bearers handrail assemblies are to be bolted on. These 1.2m long handrail assemblies will all be unique due to the varying bridge deck curvatures, so each section will be made up for the specific portion of the bridge where it needs to be erected. They each have curved baluster ribs at both ends. These ribs are to be neatly profile cut by laser from 10 mm plate. Their shape has been optimized such that the sections nest, i.e. the inner curve of one rib is the same shape as the outer curve of the next rib, to halve the amount of cutting required and so as to reduce wastage.

Joining the two curved ribs of each assembly are 4 no 20 mm diameter solid round sections. These are curved on plan, to follow the curve of the bridge. A 50 x 20 flat section, also curved on plan, is welded to the top of these curved baluster ribs. These flat sections have a 120 x 30 x 35 joining plate on top every 1.2 meters, fixed with 4 no M16 countersunk bolts per junction. The handrail will be a custom extruded rubber section that is clipped over the horizontal flat section (suggest 36m lengths for ease of handling). The clear width of the bridge between handrails is 1.4m. The wider lookout points are 2.8m wide. The trafficable deck surface is also 1.4 m wide. It consists of 80 x 40 timber battens each 1.36m long, made of a Ugandan

hardwood, with 80mm being the vertical dimension. These battens are spaced at 60 mm centers, i.e. there are 20 mm gaps between the battens. These gaps are slightly less on the inside of the curved deck and slightly more on the outside. I.e. the battens thus do not need to be tapered, but simply fan around the bends (max gap 40mm, minimum 3mm). They have tapered soffits at the outer edges for elegance.

These battens shall be screwed down, with stainless steel screws, onto two timber runners that are 100 deep by 60 mm wide. These runners need to be curved on plan to follow the curved shape of the bridge. They are thus to be laminated on site, using three sections of 100 x 20mm wide Ugandan hardwood timber. The vertical gaps between the horizontal 20 mm rods are 280mm. A thin stainless-steel cable mesh (40 x 40mm with stainless ferrules) is to be used for safety. These mesh sheets are to be tied between the top and bottom 20 mm rods and the pairs of vertical baluster ribs, to make up complete 1.2 m long assemblies that can be bolted in position on site. On-site welding is not recommended but will be allowed if welded areas are all carefully cleaned and treated with “Galvpatch”, “Zink Fix”, or approved equivalent before being touched up with the correct epoxy paint layers.

2.9.4 Tower

For preliminary details of the tower structure i.e. the tower has a platform at the walkway level and two further platforms 4m and 8m above the walkway platform level (Figure 2-11 above). Spiral staircases provide access between the 3 platforms. The three platforms are all oval in shape. Their dimensions are given on the drawing. Voids are required in the middle and upper walkway, to allow the spiral stair to come through. A circular box section, fabricated from 6 mm plate 200 high and 200 mm wide, forms the outer edge of this void, with the deck outside of this ring supported by cantilever beams, all as shown on the drawings. These rings are supported by 4 no 102 x 6 CHS columns from the lowest to the highest platform. Below the ring of the lowest platform there are 8 sloping struts to direct the forces of these 4 columns back to the central column.

The entire structure is supported by a central column down onto the foundation, which is made up of a lattice of 8 no 89 x 4.5 CHS pipes. From the lowest platform level down to the base 10 mm diagonal rods are used to stiffen the structure against shear and torsional forces. Above the top walkway is a fabric canopy that spans from a push-up point in the middle to a channel section that forms the oval shaped outer edge. The stairs are made of marine plywood, 32 mm in thickness, cut to the appropriate wedge shape. The rest on cleats fixed to steel plates that spiral up along the inner and outer edges of the steps, as indicated on the drawings. 80 x 40 timber battens as used on the walkways are using for the decking of these platforms. At the outer edge of the spiral stairs vertical stainless-steel wire mesh is tied in position between the steel tube handrail at the top and the spiraling outer stairs plate at the bottom.

Around the outer perimeter of the walkway the balustrade details will be similar to those along the sides of the walkways, i.e. also pairs of baluster ribs bolted at 1.2m centers to brackets welded to the 100 x 50 channel section outer ring channel, with 20 mm horizontal rods and stainless-steel wire mesh. For further details,



please refer to the drawings. Many details and connections still have to be added once the geotechnical report is complete, therefore, the assumptions highlighted in section 2.52, and a generous contingency allowance of approximately 10% was considered to allow for extra items.

2.9.5 Erection and General set-up

In assumption that the erection on site will be done using a small mobile crane that can easily move around between the trees, yet have a long enough extension to be able to reach the level of the deck where it is at its highest position. Excavations for foundation pads to be done by hand, carefully controlled and hoarded off, all supervised by an environmental control officer, to ensure that there is no damage to the flora and fauna.

Concrete to be mixed and poured at the site of the excavations, within the hoarded area with no cement spill, all supervised by the Contractor's environmental control officer. All the steel components to be built neatly and well finished, since everything is visible and not hidden behind finishes. The steelwork shall be hot dip galvanized and painted with an epoxy primer and two final coats. We propose that all the painting is done in the workshop and that all the components are then carefully protected against being scratched or damaged during transport or erection. The elements can all be kept reasonable small and not too heavy to enable man power transport to the site.

2.11. Associated infrastructure

The proposed project is designed with a construction phase that minimizes the impact on the existing infrastructure. Notably, there will be no additional infrastructure introduced during the construction phase, ensuring a streamlined and environmentally conscious approach to the project. This strategy aims to reduce disruptions mainly of wildlife and thus the focus is to maintain a zero impact on biodiversity throughout the construction process. During the construction phase materials will be stored at the existing ranger camp.

It is anticipated that construction workers will stay in nearby village (Sebitoli) or in Kaswa trading center which is about 5km away from Sebitoli gate and with more accommodation space compared to Sebitoli village. However, to increase community benefits, its recommended that local community in Sebitoli are informed continuously of the proposed project to enable those with capacity prepare themselves to tap from housing project workers.

2.12. Power supply

The construction of the steel canopy walk infrastructure has been meticulously planned to minimize environmental impact, and notably, the project design eliminates the necessity for electricity usage during the construction phase. Welding of steels members will be done off site and the steel will only be transported on site for assembling. The proposed approach includes fitting and joinery of materials on site. This intentional

decision aligns with sustainable and eco-friendly practices, ensuring that the development is undertaken with minimal energy consumption, contributing to both environmental conservation and operational efficiency.

2.13. Workforce

The construction of a forest tourism canopy walk requires a skilled and diverse workforce. Unskilled or semi-skilled workforce will also be employed for different project activities. Initially, civil engineers and project managers will oversee the planning and design phases, ensuring structural integrity and safety compliance. Construction crews, including carpenters, welders, and heavy machinery operators, will be essential for building the supporting structures and walkways. Environmental specialists will work alongside these teams to minimize ecological impact, while arborists may be employed to assess and manage tree health around the construction site. Additionally, safety inspectors and quality control officers will be integral throughout the construction process to ensure all standards are met. It is estimated that between 40-20 workers will be on site during the construction phase which may last upto 3 months. Considering that the project will not need a large labor force, a few locals will be employed depending on qualification and labor requirements for the jobs and presence of qualified people in the area/district. However, for the unskilled workforce, local labor force will be considered first.

Once operational, the canopy walk will need a dedicated team for its upkeep and visitor services. Since the facility will be owned by UWA, the Authority will designate staff for different roles during the operation phase for instance, maintenance workers will regularly inspect and repair the structure to ensure ongoing safety and durability. Tour guides, knowledgeable in local flora and fauna, will enhance the visitor experience by providing educational tours. Security personnel will ensure the safety of guests, while administrative staff will handle bookings, marketing, and overall management of the facility. Additionally, conservationists and environmental educators may be brought on site to promote sustainable tourism practices and foster a deeper appreciation for the forest ecosystem among visitors.

During the construction process, it is essential to collaborate closely with environmental experts, engineers, and officials from UWA to ensure that the canopy walk becomes not only a recreational attraction but also an environmentally sustainable tourism product addition to the KNP ecosystem. To achieve this, constructing the canopy walk will entail several steps to guarantee structural integrity, safety, and minimal environmental impact. The procedure has already commenced by prioritizing compliance with strategic environmental and social safeguards. Subsequent processes, such as the selection of materials from the different suitable varieties that have been proposed and sources and the assembly of the canopy walk, will be determined by the companies chosen to build the facility.

The main access route to the Canopy Walk in KNP will be through the Sebitoli main Gate along the Fort Portal – Kampala Road. The Canopy Walk is positioned approximately 100m southwest of the Sebitoli Ranger Camp. Access to the Canopy Walk will be solely through the Sebitoli Camp, where all materials will



be delivered and subsequently transported by workers to the site. Vehicles will be responsible for transporting materials, workers, and all other deliverables to the ranger camp.

2.14. Waste management

The proposed infrastructural development for the canopy walk ensures a commitment to zero waste during the construction phase. Rigorous waste management practices will be implemented to minimize environmental impact, utilizing sustainable materials, recycling processes, and responsible disposal methods. This approach underscores UWA's dedication to eco-friendly construction, aligning with environmentally conscious practices to create a minimal waste footprint during the development of the canopy walk infrastructure. During the operation phase, the canopy walk will be fitted with small waste bins for disposing of the solid waste, while there will be bigger covered waste containers at the booking office and different points of the camp. Human waste will be disposed of in the existing pit latrines and toilets structures at the Sebitoli Camp. The toilet stances will be improved and increased to accommodate anticipated increase in people at the camp site. However, the steel shall be pre-manufactured and then assembled on site like a Meccano set thus mitigating for steel waste spill overs on site.

2.15. Tourism and land use

The implementation of a canopy walk in KNP is designed with meticulous consideration to ensure little land-take and use. The construction and operation of the canopy walk are strategically planned to integrate seamlessly into the existing forest canopy, utilizing elevated structures that do not disrupt or alter the natural terrain. This approach preserves the original land use patterns within KNP, allowing the canopy walk to co-exist harmoniously with the park's natural environment without imposing significant changes to the land.

2.16. Post construction landform and use

After the construction of the forest canopy walk in KNP, careful consideration will be given to the post-construction landform and the ongoing use of the walkway. KNP will adopt a holistic approach that prioritizes ecological integrity and visitor experience. Regarding post-construction landform, KNP management will focus on rehabilitating any areas that will be identified as disturbed during the construction process. Consideration of land matches to the surrounding topography, removing any construction remains, and implementation of any measures to mitigate all effects shall be undertaken. Vegetation shall be maintained to promote habitat restoration and enhanced biodiversity management in the area. By restoring the landform, KNP will maintain its aims to minimize the visual impact of the canopy walk and ensure that it seamlessly integrates into the surrounding natural landscape.

In terms of the use of the forest canopy walk, KNP will implement a management plan that balances visitor access with conservation objectives. The walkway will be open to visitors under the supervision of trained UWA guides who will provide educational insights into the park's ecology and conservation efforts. Visitor numbers will carefully be monitored to prevent overcrowding and minimizing disturbance to wildlife. Interpretive signage along the walkway will be put in place to enhance visitor understanding of the park's



biodiversity and the importance of conservation. Additionally, it is proposed that UWA endeavors to guide local communities in private sector opportunities from where the locals could benefit as tourists to KNP increase. Overall, KNP UWA staff will be committed to responsibly manage the post-construction landform and the use of the forest canopy walk to ensure the long-term sustainability of the park's valuable resource. Through careful planning, monitoring, and community engagement, UWA will need to strive to protect the park's natural heritage while providing visitors with an enriching and memorable experience.

2.17. Canopy Maintenance strategy

Forest canopy walks provide a unique opportunity for visitors to experience the ecosystem from a different perspective, offering unparalleled views and insights into the biodiversity of the forest canopy. To ensure the safety and enjoyment of visitors, as well as forest conservation, a comprehensive maintenance strategy is essential during operation. Firstly, regular inspections of the canopy walk structure will be conducted to identify any signs of wear, damage, or degradation. This includes inspecting the integrity of walkways, platforms, handrails, support structures, and safety harnesses. Any issues identified will be promptly addressed and repaired by qualified personnel to prevent accidents or further deterioration.

Additionally, vegetation management will remain crucial to prevent overgrowth that may obstruct pathways or compromise structural integrity. Regular (as will be deemed necessary) trimming of nearby trees and vegetation will be done to ensure clear sightlines and thus minimize the risk of falling debris. Furthermore, periodic assessments of ecological impacts should be conducted to monitor any changes in the ecosystem, allowing for adaptive management strategies to mitigate likely effects. Overall, a proactive approach to maintenance is essential to ensure the long-term sustainability and safety of forest canopy walks.

2.18. National Park Management

The KNP management will need to place paramount importance on sustainable practices throughout the entire lifecycle of the forest canopy walk, from construction to operation and eventual decommissioning. To ensure minimal disturbance to the ecosystem, measures such as careful site selection has been done and the use of eco-friendly construction materials have been proposed.

Furthermore, local communities were actively consulted and their views have been incorporated in different chapters of this report. Some of these include expected employment opportunities and fostering a sense of ownership and access to the park's resources.

Once operational, the forest canopy walk will be closely monitored by park management to ensure visitor safety and minimize ecological disruption. Regular inspections and maintenance activities will be carried out to uphold safety standards and manage the integrity of the canopy walk structure. Interpretive signage and educational programs will also be developed to enhance visitor understanding and appreciation of the park's flora and fauna conservation efforts. Throughout the operation phase, KNP Management will need to remain committed to promoting sustainable tourism practices that balance visitor experience with park resource



conservation. As the forest canopy walk reaches the end of its operational lifespan (planned to be after 100 years), KNP Management will initiate a carefully planned decommissioning process to minimize environmental impact and restore the site to its natural state. Structures and equipment will systematically be removed, with particular attention paid to waste management and recycling efforts to reduce the ecological footprint of decommissioning activities.

2.19. Project avoidance measure

The construction of the forest canopy walk in KNP will be undertaken with meticulous planning and stringent adherence to project avoidance measures to minimize environmental impact as stipulated in this statement. These ESIA were informed by the design and layout of the canopy walk to avoid or minimize disturbance to these areas. One key project avoidance measure to be employed during construction will be careful erection of the canopy walk. KNP will prioritize sections of 450m length python like forest canopy walk that have minimal ecological sensitivity and are not situated within and along wildlife habitats, and nesting sites. This will ensure that the construction of the canopy walk does not disrupt key ecological processes or threaten the survival of vulnerable species within the Sebitoli zone in the KNP.

Furthermore, planned construction activities have been designed in such a way which will minimize habitat destruction. No heavy machinery will be kept on site and all construction materials will be sourced from outside the park and they will be transported to the current ranger camp for storage before use. Construction crews will be trained in best practices for minimizing environmental impact, such as proper waste disposal and behavior in a protected area. Throughout the construction process, KNP management will work closely with environmental experts, local communities, and regulatory agencies to ensure compliance with existing enabling environment. Regular monitoring and supervision (by different stakeholders) of construction activities will be conducted to detect and address any potential environmental issues promptly.

By implementing robust project avoidance measures, KNP management will aim to ensure that the construction of the forest canopy walk will be enhanced along with the visitor experience while conserving for future generations to enjoy.

2.20. Environmental buffers

The management of environmental buffers during the construction, operation, and decommissioning of the forest canopy walk in KNP will be crucial for minimizing ecological impact and maintaining the integrity of the surrounding natural environment. During the construction phase, environmental buffers ought to be established to protect nearest habitats and wildlife from disturbance. Buffer zones are designated and important in such protected habitat as was assessed. Construction activities will be carefully planned to ensure that they remain outside these buffer zones, minimizing direct impacts on ecosystems in which construction will be taking place. Throughout the operation of the canopy walk, environmental buffers ought to continue to play a vital role in safeguarding the surrounding ecosystem. Buffer zones serve as protective barriers that help mitigate the effects of visitor traffic, noise, and other disturbances associated with tourism

activities. Restricted access zones may be established around particularly sensitive areas to minimize human-wildlife conflicts and disturbance to breeding or nesting sites. Regular monitoring of buffer zones will be conducted to ensure compliance with established management guidelines and to detect any signs of encroachment or degradation.

During the decommissioning phase, environmental buffers ought to be maintained to facilitate the restoration of disturbed areas and the reestablishment of natural habitat connectivity. Buffer zones will serve as transition areas between the decommissioned canopy walk site and undisturbed natural habitats, allowing for the gradual recovery of ecosystem functions. Restoration efforts will focus on removing any remaining infrastructure, restoring soil stability, and replanting native vegetation within buffer zones to enhance habitat quality and biodiversity. By carefully managing environmental buffers throughout the entire lifecycle of the canopy walk, KNP ensures the long-term sustainability of this valuable natural resource while protecting the ecological health of the surrounding landscape.

2.21. UWA approach during project implementation

The UWA adopts a comprehensive and proactive approach to the management of construction, operation, and decommissioning of the forest canopy walk in Uganda's protected area system. This approach is grounded in sustainable practices, community engagement, and ecological stewardship, ensuring the long-term conservation of natural resources while providing meaningful experiences for visitors.

2.20.1 Pre-Construction Planning

The following approaches will need to be considered:

- Prior to construction, UWA will need to implement the respective actions in the project ESMP to respond to the identified sensitive habitats, wildlife corridors, and cultural heritage sites that may be affected by the project.
- The CW-in-KNP site selection was based on minimizing ecological disturbance and maximizing visitor experience, with input from environmental experts, local communities, and stakeholders.
- Detailed construction plans were designed, incorporating measures to prevent forest damage and minimize habitat fragmentation.

2.20.2 Construction Phase

It is anticipated that construction of the canopy walk will last upto three months.

- During construction, UWA will implement strict environmental management protocols to minimize impacts on the surrounding ecosystem.



- Construction crews are trained in best practices for minimizing environmental disturbance, including proper waste disposal, erosion control, and habitat restoration.
- Environmental buffers are established around sensitive areas to protect them from construction activities, and regular monitoring ensures compliance with established guidelines.

2.20.3 Operation and Management

In the operational phase, the canopy walk is implemented to enrich and expand tourism offerings in KNP, ultimately enhancing the overall experience for visitors. This initiative aims to augment the range of services available to arriving visitors, adhering to established operation plans and mitigation strategies that will be developed and agreed upon by key stakeholders. Most importantly, the Sebitoli Zone within the KNP area is imperative in maintaining the tranquil and natural ambiance of the region. Such procedures may include fees charged that may include maintenance and sustainability, requirements safety among others.

- Once operational, the forest canopy walk is managed sustainably to balance visitor access with conservation objectives.
- Trained guides lead interpretive tours, educating visitors about the park's biodiversity and conservation efforts while ensuring minimal disturbance to wildlife.
- Visitor numbers are monitored to prevent overcrowding, and visitor behavior guidelines (to be developed by UWA) shall be enforced to minimize impacts on the environment.

2.20.4 Decommissioning and Closure

- When the canopy walk reaches the end of its operational lifespan, UWA oversees its decommissioning and closure with careful consideration for environmental restoration.
- Structures and equipment are removed responsibly, and the site is rehabilitated to restore natural habitat connectivity and ecosystem function.
- Community involvement is encouraged in post-decommissioning activities, fostering a sense of ownership and stewardship over the restored landscape.

2.20.5 Monitoring and Adaptive Management

- Throughout the entire lifecycle of the canopy walk, UWA conducts regular monitoring of ecological indicators to assess the effectiveness of management strategies.
- Adaptive management practices are employed to address emerging challenges and incorporate new scientific knowledge into management decisions.

2.22. Decommissioning and closure

2.21.1 Decommissioning

Decommissioning the KNP forest canopy walk may involve the systematic removal of all structures and equipment associated with the attraction. This process will begin with the disassembly of walkways, platforms, handrails, and support structures in a manner that minimizes disturbance to the surrounding environment. Careful consideration will be given to management of any natural features and habitats that may have been impacted during the disassembling process. Once all above-ground structures are removed, foundations are safely excavated and disposed of in accordance with environmental regulations then. Decommissioning is likely to also involve the removal of any signage, interpretive panels, or visitor amenities associated with the canopy walk as may be established in the UWA current visitor center. Throughout this process, close attention will be paid to waste management and recycling efforts following circularities to minimize the ecological footprint of decommissioning activities.

2.21.2 Rehabilitation

Following decommissioning, the focus is likely to shift to rehabilitating the site to its natural state as much as possible. This involves the removal of any remaining infrastructure, such as footings or concrete pads, and the recontouring of the land to match the surrounding forest topography. Whereas soil erosion was not envisaged during this impact analysis due to the thick land cover but it should be thought about thoroughly as control measures where revegetation with native plant species is wanted should be implemented to stabilize the site and prevent runoff into Sebitoli stream and R. Mpanga. Any disturbed areas are reseeded or replanted to promote the establishment of healthy vegetation and restore habitat connectivity for wildlife. Rehabilitation efforts will be needed to be guided by a comprehensive restoration plan developed in consultation with environmental experts and regulatory agencies. The restoration plan could be incorporated into the GMPs that will be regularly updated to incorporate new changes.

2.21.3 Landscape Management

Effective landscape management is essential for ensuring the long-term ecological integrity of the site following closure. This may include ongoing monitoring of vegetation dynamics, invasive species control, and periodic maintenance of erosion control structures. Additionally, regular inspections of the site are conducted to identify any signs of degradation or encroachment and to address any emerging issues promptly. Adaptive management strategies are employed to address changing environmental conditions and ensure the continued resilience of the restored ecosystem. Public access to the site may be restricted during the early stages of rehabilitation to allow for natural regeneration processes to occur undisturbed.

2.21.4 Forest Restoration

Forest restoration efforts focus on enhancing the ecological function and biodiversity of the surrounding forest ecosystem in Sebitoli zone of KNP. This will be likely to involve the implementation of reforestation projects to replant native tree species and restore habitat diversity for wildlife in case they will have been impaired during the operation. Restoration activities should be guided by UWA sustainable principles of ecological restoration that will be established or put in places, including the promotion of natural succession processes and the enhancement of ecosystem services such as carbon sequestration among others. Community engagement and education programs may be developed to raise awareness of the importance of forest restoration and to involve local stakeholders such as researchers and academia in stewardship efforts. By prioritizing the restoration of ecosystem health and functionality, the decommissioning and closure of the forest canopy walk contribute to the long-term conservation of natural resources and conservation of KNP.

2.23. Alternatives

A comprehensive feasibility study was conducted, resulting in a detailed report outlining four potential options. The preferred investment choice focused on options 3 and 4. Option 3 entails 450m walk through and among the major trees, providing visitors with a round-trip experience of the park, albeit without a lookout tower add-on. On the other hand, option 4 involves a 450m loop coupled with a 27-meter-high lookout tower facility. This option, with the tower destination en-route, is deemed ideal for offering a complete out-and-back experience of Sebitoli in KNP. This ESIA specifically is addressing the integration of alternative technologies and methodologies across all project phases, reducing potential impacts of the Canopy Walk. While the construction phase adheres to a design that avoids significant earthworks such as cut and fill, it does involve the installation of concrete foundations to ensure a stable platform for structures. Notably, this is the primary labor-intensive aspect of the project.

During construction, energy use will be minimized by avoiding welding on-site. Concrete mixing occurs outside the site, and materials will be camouflaged to blend into the natural environment, mitigating the visual impact of the project. The proposed technologies are designed with mitigation measures from the planning stage to decommissioning, ensuring adaptability for future decisions.

2.24. Current KNP operations

Presently, the operation functions as a visitor's center in the Sebitoli zone within KNP, offering accommodation that comprises three self-contained houses. Two of these houses feature twin bedrooms, while the third one has a single bedroom. All houses are fully connected to the national grid, providing access to both water and electricity. Additionally, within the same zone, ongoing chimpanzee research is taking place alongside tourism activities. The coordination of the entire operation in this area is managed by UWA staff. There are also UWA staff housing units and necessary amenities (water and electricity).



2.25. Cost Benefit Analysis of the Project

The financial analysis, economic evaluation of the project, and an expanded cost-benefit analysis for the proposed project rely on the findings of the feasibility study, including quantity surveys, costs, and units for various construction materials. Factors such as prices per visitor, overall operational expenses, labor costs, and other relevant details have significantly contributed to the analysis presented in this report. However, it is important to note that this report provides a basic overview of costs and benefits derived from an assessment, including indicative costs associated with implementing enhancement and mitigation measures, as well as monitoring expenses. Cost-benefit analysis report was presented in the feasibility study report.

2.26. Benefits related to the project

The Canopy Walk project presents various benefits both at the local and national levels, contributing to the generation of revenue and creating positive effects that extend to the local and national economies. The envisioned Canopy Walk is expected to create additional employment opportunities, requiring specialized expertise from UWA, including contractors. This opens up employment possibilities during both the construction and operational phases, with potential positions being filled by either local individuals or those with relevant skills from abroad. This initiative aligns with the government's commitment to mitigating unemployment and achieving its job creation objectives.

Primarily, the project is poised to generate revenue for KNP and the Uganda Revenue Authority (URA) through entry fees, taxes, levies, including VAT. KNP is a leading conservation area, and the introduction of an additional tourism product is likely to increase revenue for the park. It is anticipated that there will be other charges and fees as the proposed development diversification takes shape.

The employment opportunities arising from the Canopy Walk project have the potential to enhance workers' incomes, thereby improving their quality of life and, potentially, prompting lifestyle changes. The specific remuneration details, such as payment structures and qualifications, are currently unclear. However, it is evident that the employment opportunities and salaries offered will extend beyond the immediate workers, benefiting numerous individuals, including dependents. This reflects a positive impact on the broader community and supports the government's initiatives for socio-economic development.

Employment opportunities and the benefits therein will depend on whether there are suitably qualified local personnel that can take up positions with the Canopy Walk management. For some reasons or the other aerial guiding may require capacity building therefore is a prerequisite for these benefits to be realized.

In addition to capacity building, there will be a necessity for intentional plans and programs that encourage investments in the hospitality industry, specifically targeting the employment of local labor with the necessary skills and experience. The hospitality industry, particularly hotels and lodges, has faced criticism for showing preference to external hires over local workforce, even in positions suitable for local personnel. Without

explicit policies and effective enforcement, these criticisms will persist and pose a challenge to government initiatives aimed at generating more employment opportunities for Ugandans.

Another advantage is to the local and national economy through the sale of construction materials, transportation, agricultural and livestock goods and services, as well as taxes and levies collected by the Uganda Revenue Authority (URA) from various services. Although the actual demand for these services is uncertain, local communities are likely to benefit by providing such goods and services such as need for accommodation facilities that are expected to emerge in the area during the construction phase (by the construction contractor). Realizing benefits for local communities depends on implementing specific plans and programs that establish a connection between the development of the Canopy Walk and the local economy. This would involve local communities producing and offering various goods and services to the tourism industry. The government has a role to play in encouraging local communities to leverage the Canopy Walk development and overall tourism growth. This would also require improving the quality of services and products offered to the industry. The benefits are bulleted below;

- **Employment Opportunities:** The construction and operation of the Canopy Walk are expected to generate employment opportunities. This may include jobs for both skilled and unskilled labor during the construction phase, as well as positions for aerial guides, hospitality staff, and support personnel during the operational phase.
- **Income Generation:** Local communities can benefit from increased economic activities related to tourism. Businesses providing goods and services, such as accommodation, food, transportation, and handicrafts, stands to gain income through increased demand from tourists visiting the Canopy Walk.
- **Skills Development:** The demand for tourism-related services can lead to skill development within the local workforce. Training programs may be initiated to equip individuals with the necessary skills for jobs in the tourism and hospitality sectors.
- **Local Business Opportunities:** The Canopy Walk may stimulate entrepreneurship and the establishment of new local businesses such as women in entertainment. Entrepreneurs can explore opportunities such as guiding services, souvenir shops, and eco-friendly initiatives.
- **Infrastructure Development:** The development of the Canopy Walk may prompt improvements in local infrastructure especially in Sebitoli adjacent community, including utilities, benefiting both the tourism industry and local residents.
- **Cultural Exchange:** Increased tourism often fosters cultural exchange and understanding between visitors and local communities. This can lead to the preservation and promotion of local cultures and traditions.

- **Revenue Generation for KNP:** The Canopy Walk is likely to attract more visitors to Kibale National Park, resulting in increased revenue through entry fees and other charges. These funds can be reinvested in conservation efforts and community development projects.
- **Promotion of Conservation:** Tourism attractions like the Canopy Walk can enhance awareness about the importance of conservation. Visitors may gain a deeper appreciation for the natural environment and wildlife, encouraging support for conservation initiatives.
- **Diversification of Tourism Offerings:** The Canopy Walk contributes to the diversification of tourism offerings in KNP, making it a more attractive destination for a broader range of visitors and potentially extending the tourism season.
- **Enhanced Quality of Life:** The socio-economic benefits derived from the Canopy Walk, including employment opportunities and income generation, have the potential to improve the overall quality of life for local residents.

It is important to note that the realization of these benefits depends on effective planning, stakeholder engagement, and sustainable management practices associated with the development and operation of the Canopy Walk.

2.27. Costs related to the project

It is estimated that the project will cost **1,849,417 USD (One Million Eight Hundred Forty-Nine Thousand Four Hundred Seventeen United States Dollars)**. Since some of the impacts will only be realized during construction phase, then the costs for these will also be short term, especially if mitigation measures are fully implemented. For example, construction will take a short time because the only considerable external material to be brought in the construction area is concrete, steel bars and wood. The rest of the costs will be towards workers. This will not go beyond the construction phase. However, impacts such as wildlife disturbance due to back and forth human movements may have long-term indirect effects, which would add on the project costs such as management of the aerial environmental degradation which may occur as a result of implementing the Canopy Walk project as well as its anticipated positive effects on visitor experience. UWA may have to invest more in advertising in case the canopy walk visitors (increase in number of tourists) damage the park image. Nevertheless, some of the mitigation measures suggested within this report have been allocated budget estimates so as to minimize impacts and enhance tourism performance locally and nationally.

3. POLICY, ADMINISTRATIVE AND LEGAL FRAMEWORK

The section prescribes the Government of Uganda policies, legal and the regulatory framework that will be triggered by the implementation of the Project which must be complied with.

3.1. Policy Framework

3.1.1 The National Environment Management Policy, 1994

The National Environment Management Policy for Uganda seeks to meet the following objectives:

- i. Enhance the health and quality of life of all people in Uganda and promote long-term, sustainable socio-economic development through sound environmental and natural resource management and use;
- ii. Integrate environmental concerns in all development policies, planning and activities at national, district and local levels, with full participation of the people;
- iii. Conserve, preserve and restore ecosystems and maintain ecological processes and life support systems, especially conservation of national biological diversity;
- iv. Optimize resource use and achieve a sustainable level of resource consumption;
- v. Raise public awareness to understand and appreciate linkages between environment and development; and
- vi. Ensure individual and community participation in environmental improvement activities.

The policy generally requires that projects or policies likely to have significant adverse environmental or social impacts undertake an ESIA before their implementation.

Compliance measure: With this policy requirement for implementation, this ESIA is being undertaken by the developer of the proposed project.

3.1.2 The Uganda Wildlife Policy, 2014

Within this policy it is recognized that out of Uganda's total surface area of 241,551sqkm (both land and water), 25,981.57sqkm (10%) is gazetted as wildlife conservation areas, 24% is gazetted as forest reserves and 13% is wetlands. Uganda has 10 National Parks, 12 Wildlife Reserves, 10 wildlife sanctuaries, 5 community wildlife areas, 506 central forest reserves and 191 local forest reserves. It is however estimated that over 50% of Uganda's wildlife resources remain outside designated protected areas, mostly on privately owned land. One of the objectives of this policy is to sustainably manage wildlife populations in and outside wildlife protected areas including those in forest reserves and wetlands.

Compliance measure: Project workers are expected to work within this Protected Area while undertaking construction activities for the canopy walk. Project workers will be prohibited from interacting or posing risk to wildlife within the park.



3.1.3 The Uganda Forestry Policy, 2001

The Goal of the forestry policy is to ensure an integrated forest sector that achieves sustainable increase in the economic, social and environmental benefits from forestry and trees by all the people of Uganda especially the poor and the vulnerable. It aims at protecting the natural resources on behalf of the people of Uganda. The government recognizes that Uganda's forests and woodlands are central to the three pillars of sustainable development - the economy, society and the environment - and that the sector is not being given adequate priority. The country's forest resources provide energy, forest and tree products, employment, livelihoods support, government revenues, business opportunities, environmental functions and services, and they maintain ecological integrity, and therefore should be protected.

Compliance measure: *With this policy requirement in mind, this ESIA is being undertaken by the developer to identify environmental and social risks and impacts of the proposed Canopy Walk in Kibale Forest Reserve and suggest mitigation measures to minimize the risks and impacts.*

3.1.4 National Environment Health Policy, 2005

Within this policy, it is noted that Environment health encompasses a wide range of subjects but in the Uganda, context is concerned with; water supply, sanitation and hygiene promotion, solid, liquid and hazardous and health care waste management, air pollution control, food safety and hygiene, the control of insect vectors and vermin, occupational health and safety, road safety and housing conditions. The Ministry of Health is the lead agency for the implementation of this policy through institutional arrangements at town and District levels.

Compliance measure: *The proposed project involves construction of a canopy walk, disposal of waste and pollutants, hence the requirement for observation of this policy.*

3.1.5 The National Water Policy, 1999

The National Water Policy seeks to manage and develop the water resources of Uganda in an integrated and sustainable manner, so as to secure and provide water of adequate quantity and quality for all social and economic needs of the present and future generations with full participation of the stakeholders.

Compliance measure: *The establishment of the canopy walk and its associated facilities will require the use of water to carry out various activities and this water must be used in a sustainable way. The ESIA for the project will aid in achieving the goal of the national water policy.*

3.1.6 Uganda Gender Policy 2007

The Uganda Gender Policy mandates the Ministry of Gender, Labour and Social Development and other Line Ministries to mainstream gender in all sectors. It sets priority areas for action at the National, Sectoral, District and Community levels. The ultimate objective of this policy is to evolve a society that is both informed and conscious of gender and development issues and concerns because sustainable development calls for maximum and equal participation of both men and women in economic, political and social cultural development.

The Sector Ministries and Sector Working Groups are required to translate the policy into sector specific strategies and activities, build capacity of staff in gender analysis, planning and budgeting; monitor and evaluate sector Programmes for their impact on gender equality; commit adequate resources for implementation of gender related activities; disaggregate data and information by sex and gender where applicable; and to collaborate with MGLSD on matters of gender mainstreaming.

Compliance measure: Gender equality shall continue to be integrated into construction and post construction activities of the project-by-project management to minimize socio-economic impacts.

3.1.7 National Policy on Elimination of Gender Based violence, 2016

The policy emphasizes early intervention to prevent re-victimization of and long-term effects for girls, including interpersonal violence, sexual coercion, alcohol and drug abuse and mental health problems; Reporting cases of violence against children immediately. Immediate action should be taken by community members, police, teachers, parents and all stakeholders.

Compliance measure: The proposed project shall put in place a policy on elimination of gender-based violence and work hand in hand with community members and stakeholders to address gender issues.

3.1.8 National Policy on Disability, 2006

Section 19 makes it the responsibility of all organs in the public or private institutions to provide suitable entrances and exits for Persons with Disabilities (PWDs) and universal standards or designs for infrastructure. Additionally, Section 22 requires availability of accessible transport services to PWDs, who use mobility devices such as crutches and/ or callipers, or wheelchairs. Transport systems like aeroplanes, trains, taxis, buses and motorcycles should be accessible to PWDs.

Compliance measure: Care shall be taken to ensure that the canopy walk design assimilates the needs of PWDs.

3.1.9 National Orphans and other Vulnerable Children's Policy, 2004

The goal of the Policy is full development and realization of rights of orphans and other vulnerable children. The policy provides support to vulnerable children and families such that their capacity to sustain themselves is strengthened; and provides residential care for orphans and other vulnerable children as a last resort.

The policy objectives are:

- i. To ensure that the legal, policy, and institutional framework for child protection is developed and strengthened at all levels;
- ii. To ensure that orphans, vulnerable children and their families access basic essential services package; National Orphans and other vulnerable children Policy
- iii. To ensure that resources for interventions that benefit orphans and other vulnerable children are mobilized and efficiently utilized; and
- iv. To ensure that the capacity of duty-bearers for orphans and other vulnerable children to provide essential services is enhanced.

Compliance measure: *In line with this policy requirement, this project will ensure that orphans and vulnerable children are supported where need is identified.*

3.1.10 The Uganda National Land Policy, 2013

The goal of this policy is to ensure efficient, equitable and optimal utilisation and management of Uganda's land resources for poverty reduction, wealth creation and overall socio-economic development.

Policy statement number 14 states that: "the state shall exercise the power of public regulation of land use, in the interest of socio-economic welfare and development." In addition, policy statement (d) states that, "Government shall ensure that all land use practices conform to land use plans and the principles of sound environmental management, including biodiversity conservation, soil and water protection, conservation and sustainable land management".

Compliance measure: *The proposed canopy walk will be established in Sebitoli area, which is one of the gazetted tourism zones by the Uganda Wildlife Authority as per the Kibale National Park General Management Plan (2015-2025). The other tourism zones are Kanyanchu and Manairo. The project will utilize land designated for wildlife conservation and tourism, and may aggravate sanitation issues, and land degradation. Measures to minimize environmental and social impacts related to land have been proposed.*

3.1.11 The National Aids Policy (2004)

This provides overall policy framework for national HIV/AIDS response. The National Policy on HIV/AIDS recognizes special groups, which include migrant workers. The Policy recommends the need to identify strategies to address migrant workers in view of the challenges posed by mobility and vulnerability to HIV. This is in line with the Constitution of the Republic of Uganda, 1995 Article 39. This Article creates the right

to a clean and healthy environment, implying that workplace safety and health (including prevention of HIV infection), is a basic right of every citizen. Under its General Objective XIV, the State is committed to fulfilling the fundamental rights of all Ugandans to, among others, social justice and economic development and shall, in particular, ensure that all developmental efforts are directed at ensuring the maximum social and cultural well-being of the people.

Compliance measure: *The workers, who may come from outside the project area during construction of the proposed canopy walk and the community, are likely to be exposed to the spread of HIV/AIDS. The strategies to fulfill the objective of this policy will need to be incorporated in the project during the planning process.*

3.1.12 Uganda's Vision 2040

In Vision 2040, Uganda sets goals to achieve by the year 2040 ranging from political, economic, social, energy, and environment. With respect to environmental goals, Ugandans aspired to have sustainable social-economic development that ensures environmental quality and preservation of the ecosystem.

Compliance measure: *The proposed project provides local and foreign communities with tourism opportunity that promotes socio-economic development and biodiversity conservation. Therefore, vision 2040 will be applicable in this project.*

3.1.13 National Policy on HIV/AIDS in the World of Work, 2007

Formulated in 2007, the policy focuses on the workplace and acknowledges that it is the workplace where the working population spends most of its active lifetime. The key principles underlying its implementation are non-discrimination, confidentiality; HIV testing, greater involvement of people living with HIV/AIDS (GIPA); promotion of prevention; treatment, care and support as well as gender concerns in the world of work. It provides a framework for prevention of further spread of HIV and mitigation of its social economic impact within the world of work in Uganda. The policy further defines the roles of key stakeholders namely government, employers, workers and the private sector including the informal sector, people living with HIV/AIDS, civil society organization and development partners. Amongst the roles for employers is the formulation of a sound HIV/AIDS policy, around the principle of non-discrimination, equality, confidentiality, care and support and incorporation of HIV/AIDS training into new worker inductions.

Compliance measure: *The project workers who might interact with locals in the project area may be at risk of contracting HIV/AIDs. Therefore, the developer will be required to institute and implement an HIV/AIDs work place policy to ensure adequate prevention mechanisms and support to infected/ affected persons is provided.*

3.1.14 The National Policy on HIV/AIDS (2004)

This policy provides overall policy framework for national HIV/AIDS response. The National Policy on HIV/AIDS recognizes special groups, which include migrant workers. The Policy recommends the need to identify strategies to address migrant workers in view of the challenges posed by mobility and vulnerability to HIV. This is in line with the Constitution of the Republic of Uganda, 1995 Article 39. This Article creates the right to a clean and healthy environment, implying that workplace safety and health (including prevention of HIV infection), is a basic right of every citizen. Under its General Objective XIV, the State is committed to fulfilling the fundamental rights of all Ugandans to, among others, social justice and economic development and shall, in particular, ensure that all developmental efforts are directed at ensuring the maximum social and cultural well-being of the people.

Compliance measure: *The project workers that migrate to the project area and those living in the area are at risk of contracting HIV/AIDS. Therefore, the project proprietor will institute and implement an HIV/AIDS policy to minimize its spread.*

3.1.15 The Uganda National Youth Policy 2016

Uganda National Youth Policy 2016 (NYP) is premised on the need to address a range of challenges that the youth face in the development process as well as harness their potential to contribute to national development. It highlights appropriate objectives, strategies, principles, priority strategic areas, implementation framework, and monitoring and evaluation mechanism. The revised NYP reiterates the commitment of government, as espoused in the National Development Plan 2016-2020 (NDPII), to undertake systematic youth programming through a multi-sectorial strategy involving relevant Ministries, Departments and Agencies, development partners, private sector, civil society organizations, communities and the youth. The revised policy targets all persons aged 15 to 30 years and recognizes that youth are a heterogeneous group. It also contains provisions that address the specific and special needs of the different youth categories.

Compliance measure: *The project management should hire youth during project implementation, including planning, construction and operation. Priority for employment should be given to youth from the project area since they form the majority in the demography of the region/ project area.*

3.2. Legal Framework

3.2.1 The Constitution of the Republic of Uganda

The Constitution is the supreme law of Uganda and it provides for protection of the environment; Under Article 39, the Constitution guarantees the right of every Ugandan to a clean and healthy environment. The Constitution, therefore, requires that the project to be implemented without endangering human health and the environment.



It has provisions that oblige the state to promote and preserve those cultural values and practices which enhance the dignity and well-being of Ugandans (Principle XXIV), mandate the central Government to manage national monuments, antiquities and archives as parliament shall determine (189 (1) schedule 6(10); and require Districts to cooperate to promote cultural and traditional lands (Fifth Schedule article 178).

Compliance measure: *The proposed project activities must be carried out within observance of the constitutional rights and without jeopardizing human health and the environment.*

3.2.2 The National Environment Act, 2019

Section 113 of the National Environment Act (NEA), 2019 requires the developer of a project set out in Schedule 5 of the Act, to conduct an Environmental and Social Impact Assessment by way of scoping, prepare terms of reference for the environmental and social impact study, and undertake an environmental and social impact study.

The proposed project falls under the category of "hotel, tourism and recreational development" in Schedule 5 of the NEA, 2019. Schedule 5, Section 10 (e) lists the establishment of zip lines, canopy walks, cable cars, hot air balloons, paragliding, bungee jumping or related infrastructure, as projects for which environmental and social impacts assessment is mandatory.

Compliance measure: *By carrying out this Environmental and Social Impact Assessment, the project has fulfilled the provisions of this Act.*

3.2.3 Local Governments Act, Cap 243

This Act provides the legal foundation of the Government Policy on decentralization and devolution of functions, powers, and services to Local Governments. Under this Act, district and lower local councils are given the responsibility of managing their natural resources including environment at the Local Government level. Natural Resources Committee is responsible for environmental issues at the district.

Compliance measure: *The Kabarole District Local Government was involved in the ESIA, and in issues of environmental monitoring and compliance. They will continue to be involved in project development implementation and operation in line with this Act.*

3.2.4 The Uganda Wildlife Act, 2019

The Wildlife Act established the Uganda Wildlife Authority and has several sections on the management of wildlife conservation areas among other issues pertaining to wildlife in Uganda. Relevant contents of this Act include; Restrictions on ownership of every wild animal and wild plant existing in its wild habitat to

Government, Requirement for environmental impact assessment for any project which may have a significant effect on any wildlife species or community. Uganda Wildlife Authority was established under this act to ensure the sustainable management of wildlife Conservation Areas.

The purpose of the Act among others is to provide for; the conservation of wildlife throughout Uganda so that the abundance and diversity of their species are maintained at optimum levels commensurate with other forms of land use, in order to support sustainable utilization of wildlife for the benefit of the people of Uganda, the sustainable management of wildlife conservation areas, the conservation of selected examples of wildlife communities in Uganda, the protection of rare, endangered and endemic species of wild plants and animals, the implementation of relevant international treaties, conventions, agreements or other arrangement to which Uganda is a party; and Public participation in wildlife management. Section 23 of this Act makes ESIA a requirement for any developer desiring to undertake any project which may have a significant effect on any wildlife species or community to undertake an environmental impact assessment in accordance with the National Environment Act, 2019.

Compliance measure: *The proposed site for development of the canopy walk is located within a wildlife conservation area, thus, all biodiversity, including wildlife of conservation concern that shall interact with the project site and surrounding, and within the entire park, shall be conserved by the project.*

3.2.5 The National Forestry and Tree Planting Act, 2003

Section 38 of this Act requires that a person intending to undertake a project or activity, which may impact a forest, should undertake environment and social impact assessment studies to evaluate the magnitude and extent of forest destruction and the mitigation measures for salvaging the forest.

Compliance measure: The proposed development site is located within Kibale Forest; hence, by undertaking this ESIA, UWA is following this policy.

3.2.6 The Water Act Cap 152, 1995

According to Part II (Water Resources) of Water Act, the Minister and the Director are responsible for the implementation of this Act which provides for the use, protection and management of water resources and supply. Part I Section 4(1) of the Act spells out the objectives which include the coordination of all public and private activities which may influence the quality, quantity, distribution, use or management of water resources. Part I Section 6 (1) stipulates that notwithstanding any other law to the contrary; no person shall acquire or have a right to:

- (a) Use any water
- (b) Construct or operate any works; or



(c) Cause or allow any waste to come into contact whether directly or indirectly with any water, other than under the provision of this Part of the Act.

Compliance measure: *The developer of the proposed project will abide by the provisions of this Act since the project will make use of water for its implementation especially during construction.*

3.2.7 The Plant Protection and Health Act 2015

The Plant Protection Act consolidates and reforms the law relating to protection of plants against destructive diseases, pests and weeds; this is entailed at prevention of introduction and spread of harmful organisms that may adversely affect Uganda's agriculture, the national environment and livelihood of the people. This intends to ensure sustainable plant and environmental protection, to regulate the export and plant and plant products and introduction of new plants in accordance with international commitment. The Commissioner for Agriculture is charged with the due administration of the Act, and the responsible Minister has power to make rules for the prevention of spread of an introduced plant, among others.

Compliance measure: *The project management shall ensure that invasive species are controlled in the park.*

3.2.8 The Access to Roads Act, 1965

The Access to Roads Act seeks to ensure that a private land owner who has no reasonable means of access to public highway may apply for leave to construct a road of access to a public high way. The law establishes a mechanism for applying for such a road. It also establishes a legal regime to ensure the safety of the neighboring environment.

The Act permits the owner of any land who is unable through negotiations to obtain leave from adjoining land owners to construct a road of access to the public highway, to apply to a magistrate for leave to construct a road of access over any land lying between his land and the public highway. The law also provides for means by which an order for the construction of an access road can be invoked. The Act further provides for maintenance of the access road in a good and efficient state of repair, and for payment of compensation by the applicant in respect of the use of land, the destruction of crops or trees and such other property.

Compliance measure: *This Act is applicable to the proposed project considering that access roads to enable access the different project facilities shall be enlarged since they are already existing.*

3.2.9 The Historical and Monuments Act, 1967

This is an Act to provide for the preservation and protection of historical monuments and objects of archaeological, paleontological, ethnographical and traditional interests and for other matters connected therewith. Section 1 of this Act describes these terms used above. Section 8 of this Act specifies actions that

are prohibited. Section 11 stipulates that any discoveries of the objects made that are considered to be of importance according to this Act shall be reported to the conservator of antiquities or district commissioner or the curator of the museum within fourteen days. Any person who contravenes any of the conditions issued under this Act commits an offence and this attracts a fine as stipulated in Section 19 of this Act.

Compliance measure: *A Physical Cultural Resources assessment was undertaken and results are presented in section 4.2.11. However, during construction, the contractor may come across chance finds of cultural and archeological importance, thus making this Act relevant. The contractor will follow the national, World bank and international chance finds procedures in case cultural and archeological objects are found.*

3.2.10 The Occupational Safety and Health Act, 2006

This is a two-way Act that obliges employers to protect their workers and charges the employees to take responsibility of their safety while at work. The Act is concerned not only of the work area but also its immediate environment. According to section 13 (1) a of the Occupational Safety and Health Act, it is the responsibility of an employer to take as far as reasonably practicable, all measures for the protection of his or her workers and the general public from the dangerous aspects of the employer's undertaking at his or her own cost. Section 19 (2) further spells that it shall be the duty of an employer to ensure that Personal Protective Equipment provided under sub section (1) is used whenever it is required.

Compliance measure: *This Act is of relevancy to this project during its construction and operation, to guarantee the safety of all the workers, and other members of the public that will be involved in the project, as well as the surrounding community members of the respective villages.*

3.2.11 The Workers Compensation Act, 2000

The Act provides for compensation of workers for injuries suffered and scheduled diseases incurred in the course of their employment. The Act further spells out degrees of compensation depending on the levels of incapacitation, calculation of respective earnings, medical examination and treatment of workers, agreement as to compensation by the worker, power of Court to submit question of law, determination of claims and decisions of the court concerning the treatment of medical reports as well as procedures relating to claims.

Compliance measure: *In accordance with the Workers Compensation Act, 2000, the project will compensate workers that shall be injured or incapacitated due to work related incidents/accidents.*

3.2.12 The Public Health Act, 1964

Under this Act, the Minister may cause to be made such inquiries as he or she may see fit in relation to any matters concerning the public health in any place. When such a directive is made, the person directed to make the inquiry shall have free access to all books, plans, maps, documents and other things relevant to

the inquiry and shall have in relation to witnesses and their examination and the production of documents, similar powers to those conferred upon commissioners by the Commissions of Inquiry Act, and may enter and inspect any building, premises or place, for the purpose of inquiry.

Compliance measure: *For the construction of workers' camps, the provisions of this Act will be relevant for its inspection and any other machinery and workers' work conditions.*

3.2.13 Employment Act No 6, 2006

Employment Act, 2006 repeals Employment Act, Cap 219 enacted in 2000. This Act is the principal legislation that seeks to harmonize relationships between employees and employers, protect workers' interests and welfare and safeguard their occupational health and safety through:

- Prohibiting forced labour, discrimination and sexual harassment at workplaces (Part II; Part IV)
- Providing for labour inspection by the relevant ministry (Part III)
- Stipulating rights and duties in employment (weekly rest, working hours, annual leave, maternity and paternity leaves, sick pay, etc. (Part VI).
- Continuity of employment such as continuous service, seasonal employment, etc. (Part VIII)

This law revises and consolidates laws governing individual employment relations and matters related to it. Similar to the Constitution, as earlier mentioned, it makes it an unlawful to discriminate people in employment. It defines discrimination as any distinction, exclusion or making preference on the basis of race, color, sex, and HIV status or disability amongst other which has the effect of nullifying or impairing the treatment of a person in employment or occupation or prevents an employee from obtaining any benefit under a contract of service.

Sexual harassment is one of the factors that put workers at the risk of HIV/AIDS. The Employment Act also makes it an offence for an employee's employers or their representative to make a request for sexual intercourse, contact or any other form of sexual activity either directly or indirectly that contains implied express promise for preferential treatment in employment, threat of detrimental treatment, threat about present or future employment status of the employee. They also commit an offence when they use a language whether written or spoken of a sexual nature, use visual material of a sexual nature or show physical behavior of a sexual nature which directly or indirectly subjects the employee to behavior that is unwelcome or offensive to that employee and that either by its nature or through repetition has detrimental effect on that employees employment, job performance or job satisfaction and exposes or makes the employee vulnerable to situation that expose him or her to HIV/AIDS and other STIs. The Employment Act also states that HIV status does not constitute fair reasons for dismissal or for the imposition of a disciplinary penalty.

Compliance measure: *The Employment Act therefore requires to be made known to the project contractors or their representatives and adhered to promote a health working environment for all those employed.*



Worker's welfare is one of the issues that require to be regularly monitored by the lead agency or any other assigned agency.

3.2.14 Children Act Cap 59

The Act was put in place to reform and consolidate the law relating to children; to provide for the care, protection and maintenance of children; to provide for local authority support for children; to establish a family and children court; to make provision for children charged with offences and for other connected purposes. The act defines a child as a person below the age of 18. It lists the right for children to be with their parents, circumstances under which they should not, foster care and adoption procedures as well as mandates of local authorities and roles of community.

Compliance measure: *Child labour will be prohibited on the project in accordance with this Act. Therefore, children below 18 years of age will not be hired.*

3.2.15 The Traffic and Road Safety Act, 1998

This act provides for administration, records, registration and licensing of motor vehicles, driving permits, and licenses for public service, private omnibus and goods vehicles, use of motor vehicles, control of traffic, enforcement, and national Roads Safety Council.

Compliance measure: *Provisions in the Act will therefore inform the traffic management plan that has to be developed for the project during its construction phase*

3.3. Regulatory Framework

3.3.1 The National Environment (Environmental and Social Assessment) Regulations, 2020

Section 3 (Part I) of these Regulations apply to—

(a) a project or activity for which—

- (i) a project brief is required to be undertaken in accordance with section 112 and Schedule 4 of the NEA;
- (ii) an environmental and social impact study is required to be undertaken in accordance with section 113 of the Act and Schedule 5 of the Act;
- (iii) an environmental risk assessment is required under section 114 of the National Environment Act (NEA);
- (b) a project or activity proposed to be located in or near an environmentally sensitive area in accordance with section 113 (2) and Schedule 10 of the Act.

Compliance measure: *This ESIA was done in accordance with these regulations' requirements.*

	56

3.3.2 National Environment (Noise Standards and Control) Regulations, 2003

Subject to these regulations, no person shall, for an activity specified under regulation 6, emit noise in excess of the permissible noise levels provided under the first schedule of the Regulations, unless permitted by a license issued under these regulations. Part III Section 8 (1) requires machinery operators, to use the best practicable means to ensure that the emission of noise does not exceed the permissible levels presented under the first schedule of the regulations, some of which are presented under Tables 3-1, 3-2 and 3-3 below.

Table 3-1: Maximum permissible Noise levels for impact or impulsive noise

Column 1	Column 2
Sound Level dB (A) (Lmax)	Permitted number of impulses or impacts per day
140	100
130	1,000
120	10,000

Table 3-2: Maximum permissible noise levels for construction sites

Column 1	Column 2	
Facility (Leq) in dB (A)	Maximum noise level permitted	
	Day	Night
Hospitals, schools, institutions of higher learning, homes for the disabled, etc.	60	50
Buildings other than those prescribed in (i)	75	65
*Time frame: Day 6. 00a.m -10.00 p.m; Night 10.00 p.m. - 6.00 a.m.		

Source: The National Environment (Noise Standards and Control) Regulations, 2003

Compliance measure: Noise will be emitted from different activities of the project including transportation of construction material and equipment, digging of pits, during assembling of the pillars, etc. All noise generating activities will adhere to the noise standards and control regulations, and the UWA Operational Guidelines for Developments in Wildlife Protected Areas (UWA, 2020).

3.3.3 The National Environment (Waste Management) Regulations, S.I. No.49, 2020

These Regulations apply to all waste classified, characterized and categorized under Schedule 2, Schedule 3 and Schedule 4 to these Regulations; the generation, collection, transportation, storage, treatment and disposal of waste; to transboundary movement of waste; and to all waste management facilities.

Responsibility for waste management.

A person who generates waste, a waste handler or product steward has a duty of care and shall take measures to ensure that—

- waste is managed appropriately and securely in accordance with the Act, these Regulations, any other applicable law, environmental standards and conditions of the license;



- waste is managed in a manner that does not cause harm to human health or the environment;
- any leakage or spillage of waste is quickly detected and managed; and spillages which may cause pollution are managed in accordance with regulation 95.

The regulations also describe issues such as sorting and disposal of domestic waste, cleaner production methods, application for licenses for transportation and storage of waste, packaging of waste and powers of environmental inspector among others.

Compliance measure: *Construction and operation of the canopy walk and other facilities is expected to generate waste of different types and the handling of this waste shall be in accordance with these regulations.*

3.3.4 The National Environment (Control of Smoking in Public Places), Regulations 2004

The Regulations emphasize the right to clean and healthy smoke-free environment. The regulations are in line with Section 107 of the National Environment Act, Cap 153 which gives provisions of the requirements under these regulations. Furthermore, the regulations give a list of public places in which smoking is prohibited, and a list of public places in which smoking is restricted. The areas where smoking is prohibited include; Offices, office buildings and work places including individual offices, public areas, corridors, lounges, eating areas, reception areas, lifts, escalators, foyers, stairwells, toilets, laundries, amenity areas. “No smoking” sign-ages should strategically be placed at prohibited areas and areas designated as ‘smoking areas’ properly indicated.

Compliance measure: *Smoking is prohibited in the park. Thus, project workers must ensure that the requirements of these regulations are complied with.*

3.3.5 The National Environment Audit Regulations, 2020

These Regulations apply to an environmental audit for a project or activity for which environmental and social assessment has been undertaken and any other project or activity as may be prescribed by the Authority.

An environmental audit shall be undertaken to ensure compliance by the developer with the Act (National Environment Act), regulations and standards made under the Act, conditions in permits and licenses and any other applicable law, environment management systems and the environmental management and monitoring plan of the developer.

Compliance measure: *The construction, operation and maintenance of the canopy walk will require regular environmental audits as will be prescribed by NEMA. UWA should comply with the audit regulations.*

3.3.6 The Water (Waste Discharge) Regulations, 1998

Regulation 4 (1) of these regulations prohibits any person to discharge effluent or waste on land or into the aquatic environment contrary to the standards established under regulation 3 unless he or she has a permit issued by the Director of Water Resources. According to Regulation 4 (2) (a), a person granted a permit under Regulation 4 (1) shall ensure that the effluent or waste discharged conforms to the maximum permissible limits established under regulation 3 (1).

Compliance measure: Since the proposed project will generate waste during the construction and operation phases of the project, the developer for the project will have to abide by these regulations.

3.3.7 The Guidelines for Environmental Impact Assessment in Uganda, 1997

The National Environment Management Authority (NEMA) published EIA guidelines in 1997 where the ESIA process and procedures are outlined.

Compliance measure: The ESIA for the proposed project has been carried out in accordance with these guidelines.

3.3.8 The Environmental Audit Guidelines for Uganda, 1999

Section 2.1.3 of the Environmental Audit Guidelines reiterates the National Environment Act's (Part II-Section 4 (3)) requirement for all on-going activities that have or are likely to have a significant impact on the environment to be subjected to an environmental audit. An environmental audit is defined under section 2 of the NEA as a systematic; documented, periodic and objective evaluation of how well environmental organization, management, and equipment are performing in conserving the environment and its resources. Section 23(i) of the National Environment Act gives NEMA the responsibility for carrying out Environmental Audits. Under section 2.1.4 of the Environmental Audit Guidelines, it is stated that NEMA may carry out the audits by certifying auditors to carry out the audits.

Under section 2.1.8 of the audit guidelines it is stated that a developer is expected to submit the first Environmental audit report to the Executive Director, NEMA within a period of not less twelve months and not more than thirty-six months after the completion of the project or commencement of its operations, whichever is earlier, provided that an audit may be required sooner if the life of the project is shorter than the afore mentioned period. The guidelines under section 2.1.4 also reiterate section 23(3) of the National Environment Act that gives developers of projects for which an Environmental and Social Impact Statement has been made the responsibility to keep records and make annual reports to the NEMA describing how far the project conforms in operation with the statements in the ESIS.

Compliance measure: *The proposed project is likely to have some significant impacts of the environment. Therefore, the developer will be required to undertake environmental audits for the facility.*

3.3.9 The National Environment (Minimum Standards for Management of soil quality Regulations, 2001)

Section 12 of this Act requires compliance with prescribed measures and guidelines for soil conservation for the topography, drainage and farming systems, contravention of which constitutes an offence.

Compliance measure: *Measures to prevent soil contamination will be put in place by the developer.*

3.3.10 Employment Sexual Harassment) Regulation, 2012

The regulations require an employer with more than twenty-five employees to adopt a written policy against sexual harassment which includes a notice to employees that sexual harassment is unlawful, a statement of consequences for employees who are found to have committed sexual harassment, and education and training programs on sexual harassment for all employees on a regular basis.

Compliance measure: *UWA and their Contractor will develop a policy on sexual harassment to be implemented during the construction and operation phases of the project.*

3.4. Institutional Framework

Key institutions identified responsible for ensuring compliance with legal requirements and their mandate are summarized in Table 3-3.

Table 3-3: List of National Stakeholders

INSITUION	DEPARTMENT	MANDATE
Ministry of Water and Environment	National Environment Management Authority (NEMA)	Coordination, monitoring and supervision of environmental conservation activities directly or through District Environmental Officers at district level and Environmental Liaison units at ministries. Review and approval of Environmental Impact Statements (EIS) in consultation with any relevant lead agencies
Ministry of Tourism, Wildlife and Antiquities		Policy formulation, planning and coordination of conservation and development of museums and cultural heritage. Monitoring project construction activities, especially excavations to ensure that chance finds or artifacts of cultural significance are not destroyed.

INSITUATION	DEPARTMENT	MANDATE
	Department of Museums and Monuments	Concerned mostly with heritage and culture. This department may be contacted in the event of any suspected archaeological or living culture finds during construction.
	Uganda Wildlife Authority	UWA is responsible for the management and conservation of wildlife in Uganda, both in and outside the wildlife protected areas. UWA is also obliged to ensure the protection of rare, endangered and endemic species of wild plants and animals, through provision of appropriate wildlife policies, management plans and promotion of wildlife management best practices, as well as development and boosting tourism.
	Uganda Tourist Board	The Board's mandate is to promote and market Uganda across the region and internationally, promote quality assurance in tourist facilities through training, grading and classification, promote tourism investment, support, and act as a liaison for the private sector in tourism development.
Ministry of Gender, Labour and Social Development	Department of Occupational Health and Safety	Inspection of workplace environment to safeguard occupational safety, rights of workers and gender equity.
Ministry of Local Government	Kabarole District Local Government	Infrastructure and social development in accordance with district development plan Environmental and social monitoring Project approvals Review of ESIA reports Participate in the identification and selection of relocation sites. Facilitate the registration and transfer of interests in land; Review the progress of the land acquisition and resettlement implementation and problems, if any, identified through monitoring.

3.5. Multilateral Agreements

Uganda has signed and/or ratified a range of international agreements relating to the environment, both regionally and globally. The National Environment Act, 2019, provides for the implementation of the International Conventions on Environment ratified by Uganda.

The conventions relevant to the proposed established canopy walk are discussed below.

3.5.1 Convention for the Protection of the Ozone Layer and Its Montreal Protocol

The Montreal protocol to the Vienna Convention for the Protection of the Ozone Layer is an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion. The treaty was opened for signature in January 1987 and was last revised in 1999 at Beijing. It has been ratified by 96 countries; Uganda inclusive.

The Ozone depleting substances are Chlorofluorocarbons (CFCs) and Hydro chlorofluorocarbons (HCFCs). The ozone shield is important because it protects plant and animal life on land from the sun's ultraviolet rays, which can cause skin cancer, cataracts, and damage to the immune system.

Thinning of the ozone layer also may alter the DNA of plants and animals. Ozone depleting substances also act as greenhouse gases, with several thousand times the per-molecule greenhouse potential of carbon dioxide.

Uganda has put a law in place to guide in the adherence to this Protocol; The National Environment (Management of Ozone Depleting Substances and Products) Regulations 2020.

Compliance measure: Construction of the canopy walk will require a number of equipment which may use CFCs and HCFCs thus the developer of the project shall abide by the requirements of the Convention.

3.5.2 United Nations Framework Convention on Climate Change (UNFCCC)

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases. The convention encouraged industrialized countries to stabilize greenhouse gases while the Kyoto protocol commits them to do so. Uganda signed the Kyoto Protocol in June 1992, ratified it September 1993 and its enforcement was March 1994. Uganda ratified the convention in March 2002 while entry into force was February 2005. Greenhouse gases are gases in an atmosphere that absorb and emit radiation within the thermal infrared range and greatly affect the temperature of the Earth. In Uganda, Climate Change Unit in the Ministry of Water and Environment is responsible for the implementation of the strategies to meet the Conventions requirements.

Compliance measure: The emission of greenhouse gases including Carbon dioxide expected to be released from project vehicles and equipment during construction of the proposed canopy walk, and this should be limited in conformity with this convention.

3.5.3 Convention for the Safeguarding of the Intangible Cultural Heritage, 2003

The 2003 Convention for the Safeguarding of the Intangible Cultural Heritage calls on States that have ratified it to safeguard living heritage on their own territories and in cooperation with others. Ratified by more than 80 countries, it seeks to celebrate and safeguard the intangible heritage distinctive for particular communities. At the same time, the convention does not intend to establish a hierarchy among heritage elements or identify some as more valuable or important than others. The Convention affirms that the intangible heritage of all communities, whether they are large or small, dominant or non-dominant, deserves our respect.

The Convention sets out the duties of State Parties in identifying potential sites and their role in protecting and preserving them. Each member country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The State Parties are encouraged to integrate the protection of the cultural and natural heritage into regional planning programs, set up staff and services at their sites, undertake scientific and technical conservation research and adopt measures which give this heritage a function in the day-to-day life of the community.

Compliance measure: *The emission of greenhouse gases including Carbon dioxide expected to be released from construction vehicles and equipment during construction of the proposed canopy walk should be limited in support of the convention. The developer is therefore obligated to safeguard any intangible cultural heritage that may be in the project area during the implementation of the project.*

3.5.4 The Convention on Biological Diversity 1992 (CBD)

The CBD was one of the major outcomes of the 1992 United Nations Conference on Environment and Development, termed the “Earth Summit” in Rio de Janeiro. The three main goals of the Conventions on Biological Diversity (CBD) are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from utilization of genetic resources. The CBD calls for a much more holistic approach to biodiversity, by recognizing its ecosystem, species and genetic levels.

Compliance measure: *This ESIA will identify potential impacts on the biodiversity on site and surroundings, and propose feasible mitigation measures to promote its conservation, in line with the CBD.*

3.5.5 The Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention, 1972)

The convention considers the following as "cultural heritage"; monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science. Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural



and natural heritage referred to in Articles 1 and 2 and situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain.

Compliance measure: *The possibility that some physical cultural resources may be discovered during construction phase of the project makes this convention relevant. The project will be implemented in accordance with the convention requirements.*

3.5.6 The African Convention on the Conservation of Nature and Natural Resources, 1968

The Contracting States to African Convention on the Conservation of Nature and Natural Resources are required to undertake to adopt measures to ensure conservation, utilization and development of soil, water, flora and faunal resources in accordance with scientific principles and with due regard to the best interests of the people.

The Contracting States to this convention are also required to ensure that conservation and management of natural resources are treated as an integral part of national and/or regional development plans. In addition, during the formulation of all development plans, full consideration is required to be given to ecological, as well as to economic and social factors.

Compliance measure: *Because of the location of the project site within Kibale National Park, conservation of biodiversity and ecosystems will have to be taken seriously during the project as a commitment to this convention.*

3.5.7 UNESCO World Heritage Convention, 1972

In the international arena, the legal regime regarding cultural heritage basically emanates from the UNESCO World Heritage Convention, 1972. The convention is concerned with the protection of the world cultural and natural heritage. This convention gives the basis of recommendations developed by experts to conserve cultural heritage. The KNP is located within the Rwenzori Mountain system for which the Mt. Rwenzori National Park is a world heritage site. Thus, the connectivity of the ecosystems between two parks through R. Mpanga for which Rwenzori mountains is the headwaters makes it relevant to this project. Further in section 4.2.12 a considerable number of cultural sites in Kabarole District have been earmarked relevant to this proposed development too.

Compliance measure: *Uganda is member of UNESCO and as such, it is bound by the recommendation made by the convention in the protection of cultural heritage.*

3.6. World Bank Environmental and Social Standards

According to ESF document (World Bank, 2017), the World Bank Environmental and Social Framework sets out the Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. The Framework comprises; A Vision for Sustainable Development, The World Bank Environmental and Social Policy for Investment Project Financing and The Environmental and Social Standards, together with their Annexes, which set out the mandatory requirements that apply to the Borrower and projects.

The Environmental and Social Standards (ESSs) set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing. The Environmental and Social Standards (ESSs), are designed to assist borrowers to avoid, minimize, reduce or mitigate the adverse environmental and social risks and impacts from development projects. Some of the standards and guidelines that are relevant to the proposed project are highlighted below;

ESS 1: Assessment and Management of Environmental and Social Risks and Impacts;

ESS 2: Labour and working conditions;

ESS 3: Resource Efficiency and Pollution Prevention and Management;

ESS 4: Community Health and Safety

ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;

ESS 8: Cultural Heritage;

ESS 10: Stakeholder Engagement and Information Disclosure.

3.6.1 ESS1: Assessment and Management of Environmental and Social Risks and Impacts

This standard sets out the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing.

The ESSs are designed to help Borrowers manage the risks and impacts of a project, and improve their environmental and social performance, through a risk and outcomes-based approach.

As such;

- Borrowers will conduct environmental and social assessment of projects proposed for Bank financing to help ensure that projects are environmentally and socially sound and sustainable.
- The environmental and social assessment will be proportionate to the risks and impacts of the project.
- It will inform the design of the project and be used to identify mitigation measures and actions and to improve decision-making.

Borrowers will manage environmental and social risks and impacts of the project throughout the project life cycle in a systematic manner, proportionate to the nature and scale of the project and the potential risks and impacts.

Compliance measure: *The environmental and social assessment has been based on current information, including an accurate description and delineation of the project and any associated aspects, and environmental and social baseline data has an appropriate level of detail sufficient to inform characterization and identification of risks and impacts and mitigation measures.*

3.6.2 ESS 2: Labour and Working Conditions

This standard recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. The standard aims;

- To promote safety and health at work.
- To promote the fair treatment, non-discrimination and equal opportunity of project workers.
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate.
- To prevent the use of all forms of forced labour and child labour.
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.
- To provide project workers with accessible means to raise workplace concerns

Compliance measure: *Considering that over 40-20 workers will be employed on the project, the requirements of ESS2 shall be implemented throughout the project execution period.*

3.6.3 ESS 3: Resource Efficiency and Pollution Prevention and Management

The applicability of this ESS is established during the environmental and social assessment. ESS3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable.

- The Borrower will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy.

- The measures will be proportionate to the risks and impacts associated with the project and consistent with GIIP, in the first instance the EHSGs.

Resource efficiency

- The Borrower will implement technically and financially feasible measures for improving efficient consumption of energy, water and raw materials, as well as other resources.
- Such measures will integrate the principles of cleaner production into product design and production processes to conserve raw materials, energy and water, as well as other resources.
- Where benchmarking data are available, the Borrower will make a comparison to establish the relative level of efficiency.

Compliance measure: *While using water, power and material, UWA or their contractor will ensure efficient use of the resources so that wastage is minimised and pollution avoided.*

3.6.4 ESS 4: Community Health and Safety

This standard requires borrowers to evaluate the risks and impacts of the project on the health and safety of the affected communities during the project life cycle, including those who, because of their particular circumstances, may be vulnerable. The Borrower will identify risks and impacts and propose mitigation measures in accordance with the mitigation hierarchy.

This ESS addresses potential risks and impacts on communities that may be affected by project activities. Occupational health and safety (OHS) requirements for project workers are set out in ESS2, and measures to avoid or minimize impacts on human health and the environment due to existing or potential pollution are set out in ESS3.

Compliance measure: *Potential risks and impacts on communities that may be affected by project activities were identified and measures to avoid or minimize impacts on human health suggested in this ESIS (section 7.7, 7.8, 7.7.11 and 7.12).*

3.6.5 ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

Based on the environmental and social assessment, the requirements of this ESS are applied to all projects either that potentially affect biodiversity or habitats, positively or negatively, directly or indirectly, or that depend upon biodiversity for their success. ESS6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development.

- The environmental and social assessment as set out in ESS1 will consider direct, indirect and cumulative project-related impacts on habitats and the biodiversity they support.



- This assessment will consider threats to biodiversity, for example habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts.
- It will determine the significance of biodiversity or habitats based on their vulnerability and irreplaceability at a global, regional or national level and will also take into account the differing values attached to biodiversity and habitats by project-affected parties and other interested parties.
- The Borrower will avoid adverse impacts on biodiversity and habitats. When avoidance of adverse impacts is not possible, the Borrower will implement measures to minimize adverse impacts and restore biodiversity in accordance with the mitigation hierarchy provided in ESS1 and with the requirements of this ESS.
- Where significant risks and adverse impacts on biodiversity have been identified, the Borrower will develop and implement a Biodiversity Management Plan.

Compliance measure: *In adherence to ESS6, a Biodiversity Management Plan will be developed, approved by UWA and strictly implemented. This ESS sets out general provisions on risks and impacts to cultural heritage from project activities. The term ‘cultural heritage’ encompasses tangible and intangible heritage, which may be recognized and valued at a local, regional, national or global level. The requirements of this ESS8 will apply to all projects that are likely to have risks or impacts on cultural heritage. This will include a project which:*

- Involves excavations, demolition, movement of earth, flooding or other changes in the physical environment;
- Is located within a legally protected area or a legally defined buffer zone;
- Is located in, or in the vicinity of, a recognized cultural heritage site; or
- Is specifically designed to support the conservation, management and use of cultural heritage

The requirements of ESS8 apply to cultural heritage regardless of whether or not it has been legally protected or previously identified or disturbed.

Compliance measure

The requirements of the ESS will be adhered to during the project implementation.

3.6.6 ESS 10: Stakeholder Engagement and Information Disclosure

States that effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

- To establish a systematic approach to stakeholder engagement to identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.

- To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be considered in project design and environmental and social performance.
- To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them.
- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.
- To provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow Borrowers to respond to and manage such grievances.

Compliance measure: *The requirements of ESS10 will guide the development and implementation of a Stakeholder Engagement Plan to improve project sustainability. Community engagement and grievance redress should be part and parcel of activities during project implementation.*

3.7. The World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines), 2012

These are technical reference documents with general and industry-specific examples of good international industry practice. IDA and IFC use the EHS Guidelines as a technical source of information during project appraisal. The EHS Guidelines contain the performance levels and measures that are normally acceptable to IDA and IFC, and that are generally considered to be achievable in new facilities at reasonable costs by existing technology. The General EHS Guideline contains information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors.

This will be used together with the relevant industry sector guideline(s) to guide the development and implementation of Environmental, Health and Safety Management Plan for the project.

Compliance measure: *These EHS Guidelines will guide the development and implementation of an Environmental, Health and Safety Management Plan for the project.*

3.8. Permit requirements

Below (Table 3-4) are some of the permits required to be obtained by UWA before project implementation.

Table 3-4: Permits required

Type of Permit, Licence or Approval	Issuing Authority	Legislation or Regulations	Requirement	Relevance to the Project
Registration of a workplace	Department of Occupational Safety and Health Ministry of Gender, Labour and Social Development	Occupational Safety and Health Act, 2006	Section 40 (2): a person shall not less than one month before he or she begins to occupy any premises as a workplace, serve on the Commissioner, a notice with the particulars prescribed in Schedule 3.	The project will obtain a registration of workplace certificate for the construction site before start of works.
Certificate of approval of ESIA	National Environment Management Authority	National Environment (Environmental and Social Assessment) Regulations, 2020	24 (4) Where the Authority approves the project under sub regulation (1)(a), it shall issue a certificate of approval of environmental and social impact assessment in accordance with Part IV of these Regulations.	A NEMA certificate of approval is required.
Development Permission	The District Local Government Authorities	The Planning Act, 2010	Planning Act, 33 (1) A person shall not carry out a development within a planning area without obtaining development permission from a physical planning committee.	Requires the project owner to obtain necessary development permission from the District Technical Planning Committee.

4. BASELINE ASSESSMENT

4.1. Baseline Condition

4.1.1 History of the area

KNP is a tropical rain forest found within the equatorial area of formally Toro District, Western Uganda, situated between 0° 13' to 0° 41' N and 30° 19' to 30° 32' E. Positioned 24 km east of the Rwenzori Mountains, the National Park spans 56 km in a long, narrow strip running north-south, covering an area of 560 sq.km according to Isabirye-Basuta (1979) and Kingston (1967). KNP was originally divided into three blocks by the Fort Portal - Kampala and Fort Portal – Kamwenge Roads. The southern part of the KNP is adjacent to the Western Rift Valley escarpment and is only 5.6 km away from the northern end of the Rwenzori National Park. The Forest predominantly covers the drainage basin of the Dura River and partially extends to the Mpanga River basin, both of which flow into Lake George. These rivers descend gently from approximately 1620 m in the northern part of the Reserve to about 1160m in the south.

The history of eco-tourism in KNP dates back several years, but it was hindered by security and economic conditions. However, as conditions improved, efforts were initiated to promote eco-tourism, particularly among expatriate diplomats and aid workers residing in Uganda.

In the past, the Kibale Forest project endorsed ecotourism to underscore the region's conservation significance. When security conditions permitted, expatriate tourists, both local and international, frequented Kibale. The charm and natural beauty of Kibale quickly became well-known through word of mouth, leading to a steady stream of tourists. Specific areas within Kibale were designated by the Kibale Forest project for eco-tourism, and they continue to be major attractions in Uganda.

All the previously mentioned activities played a pivotal role in bringing attention to the inherent value of Kibale as a conservation area. This initiative functioned as a promotional campaign, highlighting the need to preserve Kibale. Despite facing limitations in resources and personnel, UWA exerted efforts to promote Kibale across various platforms. Table 4-1 shows the history of KNP transitioning since 1932 to date.

4.1.2 Legal Progress Status of KNP

Table 4-1: Period of transition into a national park

Year	Description
1932	The Government of Uganda officially designated Kibale as a Crown Forest, subjecting all activities within the reserve to regulation by the Forest Department under the Ministry of Agriculture. Logging emerged as the main regulated activity in the area.
1948	Kibale was officially designated as a Central Forest Reserve

Year	Description
1964	The establishment of the Kibale Forest Corridor Game Reserve was officially declared. This reserve encompassed the southern section of the Kibale Forest Reserve and savanna and grasslands to the west. It fell under the jurisdiction of the Uganda Game Department, operating under the Ministry of Tourism and Wildlife. The primary purpose of this reserve was to serve as a wildlife corridor connecting Queen Elizabeth National Park and the Kibale Forest Reserve. However, ongoing tension arose due to conflicting priorities between the Forest and Game Departments, as they held incompatible goals of logging versus wildlife and habitat preservation for this shared corridor.
1970-71	The advocacy for granting National Park status to a portion of Kibale began in 1970. In May 1971, it was disclosed the minutes by the board of trustees' meeting, endorsing the idea of National Park status for a section of Kibale. Elevating Kibale's status to that of a National Park would have necessitated the transfer of its administration to the National Parks, marking the end of control by the Forest Department. This situation exemplified a classic instance of inter-ministerial competition.
1973	Approval for the establishment of a research plot (R.P. 703) in Kibale was granted. This provided a certain level of safeguarding for the primate study area (compartments K14, K30, K33, and K34), covering a total area of 10.6 km ² . However, due to its partial alignment with departmental policy, the research plot held a relatively weak conservation status. Continuous vigilance became imperative, as illustrated a few years later operating from Sebitoli, initiated the construction of a logging road into K30.
1975	Loggers were poised to enter and harvest compartment 50 in Kibale, a move that would have effectively separated the research plot at Kanyawara (R.P. 703) from the Ngogo Nature Reserve. A proposal was made that preservation of this compartment as a corridor connecting the two conservation areas is highly significant. Despite strong opposition from the District Forest Officer of Toro J. Murekezi: Letter of 6 June 1977 Ref. WT/TO/32, a decision to protect this area from logging effectively established a link between the research plot and the nature reserve, officially safeguarding a total of 86 km ² .
1992	The government led by President Museveni, having solidified its position, started implementing robust conservation measures nationwide. Following extensive discussions over several years with illegal occupants in south Kibale, which included rejected offers of resettlement assistance, the government decided to enforce forest protection laws. In less than a week, several thousand encroachers were removed. Reports indicated that most of these individuals either returned to their initial residences or sought accommodation with family or friends.
1993	Following 23 years of persistent advocacy, Kibale was officially designated a national park, amalgamating the forest reserve and corridor game reserve into a unified entity spanning 766 km ² , under the administration of the Uganda National Parks.

4.2. Biological Environment

4.2.1 Floral

Floral Assessment Approaches

○ Ecosystem Characterization

	72

Due to significant disturbances caused by logging activities in the colonial era at the project site, and considering that certain areas of the Sebitoli Forest are still recovering from these impacts (*as per Table 4.1 above*), Langdale-Brown et al. (1964) refers to it as an L-B system, characterizing the vegetative assemblages in the project area. This decision is motivated by the system's focus on plant community composition rather than plant biomass, aligning more closely with the objective of characterizing vegetation and identifying sensitive habitats. The L-B system offers 26 vegetative categories, in contrast to the 13 categories employed by the National Biomass System (USAID 2014). The increased granularity of 26 categories enables a more detailed assessment of the potential impacts of development activities on ecosystems, providing a finer-scale understanding.

○ **Sample Site Selection**

Sample sites were chosen based on the feasibility study conducted during canopy design phase with a specific focus on the feasible area identification for the establishment of the 450m canopy, which was the selected route option following a comprehensive assessment in 2021. Also, to comprehend the potential impact to flora within the project area of influence, sampling was extended to encompass sites in the immediate vicinity of the direct footprint, within a 200m radius of the project site.

Baseline surveys were carried out in January 2024 to gather detailed data on the vegetation and flora of the project site. The studied sites were those selected where the proposed canopy walk structures were expected to significantly influence forest cover or have a substantial impact on vegetation, flora, and the overall ecological conditions of the forest ecosystem in the surrounding. The GPS coordinates were recorded at each sample location for reference purposes.

○ **Sampling Methods**

To assess the vegetation floral forms, cover and plant species composition at various locations, a systematic approach involved identifying common flora species, species of conservation concern (such as threatened, protected, rare, and endemic species, as well as invasive species), sensitive sites, and areas requiring thorough ecological surveys. The chosen method for this assessment was a simple random point sampling technique. Utilizing a GPS unit, specifically the "Garmin GPSMAP64," vegetation turnover and noteworthy landscape features were precisely marked. Additionally, photographs were taken at each geo-referenced site to visually depict the existing vegetative assemblages and the land use patterns of the proposed corridor. Characterization of vegetative communities or vegetation types was based on factors such as dominant plant species, canopy cover, landscape features, presence or absence of waterlogged soils, gradient, and land use type.

○ **Quantitative Assessment**

Quadrats with a 30m radius were specifically designed and strategically positioned at 50m intervals within the direct footprint, and at 100m intervals outside the direct footprint. Within the 30m radius plots, all woody



species of tree habit were thoroughly assessed. The 10m radius plots were utilized for assessing and enumerating small trees, shrubs, and herbs, while saplings, herbs, and graminoids were enumerated in quadrats with a 2m radius, all nested at the center of the 30m radius quadrats. This comprehensive approach ensured the inclusion of all major vegetative assemblages present at the project site.

Fieldwork conducted within each plot encompassed plant collection, structural analysis, and the characterization of species diversity for all represented flora. Also, data was collected on the evidence of current and previous disturbances and the incidence of invasion by exotic species.

○ Desk Study – Secondary Data

Various documents were reviewed to identify the features impacted by the project and assess the ecological conditions of the site. This examination aimed to comprehend the sensitivities highlighted in the project landscape. The primary documents considered for this study are as follows:

- The General Management Plan of KNP (2015-2025) encompasses five key programs. These include Resource Conservation and Management, which deals comprehensively with issues related to securing the park's integrity. The Research and Ecological Monitoring program addresses the research and monitoring needs and challenges. The Community Conservation program aims to minimize conflicts with local communities arising from the park's existence. The Park Operations program focuses on logistical and administrative requirements, while the Business Plan is designed to generate the necessary financial resources for plan implementation. The plan includes provisions for zoning and research potentials, along with a thorough account of the park's history and sensitivities related to biological resources.
- [The IUCN Red List website : www.iucnredlist.org/](http://www.iucnredlist.org/) (2023) the primary objective is to identify endangered and threatened species worldwide. A newly introduced search tool enables the identification of threatened species based on various criteria such as location, species group, and habitat. The website offers a compilation of threatened species of conservation concern. While the Red List undergoes regular updates, there are instances where species are categorized as data deficient (DD), making their accurate identification on the list challenging. This is often due to insufficiently recorded data regarding threats or because the species might be locally threatened rather than globally.
- The Uganda Biodiversity and Tropical Forest Assessment (USAID Uganda, 2006) not only offers a comprehensive overview of Uganda's primary biodiversity features but also underscores the significant threats to the conservation of natural areas. Additionally, it delves into Uganda's environmental and biodiversity legislation, explores the institutional frameworks established for environmental protection, and provides information on websites that offer environmental data.
- The Conservation Checklist of the Trees of Uganda by the Royal Botanic Gardens, Kew, England (Kalema, & Beentje, 2012) offers information on the conservation status of trees in Uganda, employing the standard IUCN criteria. The document details the distribution of these trees within Uganda and

beyond, highlighting species that are range-restricted and those unique to Uganda. It also provides the current names for Uganda's tree flora and presents a checklist of trees that are of conservation concern.

- The "Useful Trees and Shrubs for Uganda: Technical Handbook No. 10" by the Regional Soil Conservation Unit, RSCU/SIDA, Kenya (Katende, et al., 1995), introduces a checklist of trees deemed valuable by the authors. The handbook offers essential characteristics for identifying these trees and details their practical applications. Additionally, it includes some information about the occurrence of these trees within the country.
- The Vegetation of Uganda and Its Impact on Land Uses, published in Entebbe by the Uganda Government Printer (Langdale-Brown, I., et al., 1964), provides a detailed account and mapping of the various vegetation types and communities in the country. The publication identifies 26 major vegetation types and numerous subtypes within each of these.
- Ministry of Tourism, Wildlife and Antiquities (MTWA), 2018. Nationally Threatened Species for Uganda: National Red List for Uganda. This identifies and lists Ugandan threatened species and is extremely useful in determining sensitivity of receptor species.
- Uganda biodiversity and tropical forest assessment, (USAID Uganda, 2006): Apart from providing a general overview of the main biodiversity features in Uganda, the document highlights the main threats to conservation of natural areas. It also addresses Ugandan legislation for the environment and biodiversity; Institutional framework for the protection of the environment; and Websites for environmental information.
- Several research papers tackling different ecological aspects within the landscape of KNP.

These provided information on the past logging records, plant species eaten by chimpanzees and so forth.

Floral Assessment Results

The KNP encompasses a transitional moist evergreen forest situated at medium altitudes, displaying characteristics that blend features of both dry tropical and wet tropical rain forests. Within a significant portion of the park, grassland communities prevail, primarily dominated by *Pennisetum purpureum*, *Imperata cylindrica*, and *Cymbopogon afro-nardus* grasses. The emergence of these grassland communities can be attributed to human settlement fires, often set by poachers, and these areas typically occupy hilltops (KNP-GMP 2015 - 2025).

The forest cover exhibits a broad classification, with the northern part characterized as moist evergreen and the southern part as moist semi-deciduous. In the central region, the high forest presents a unique combination of deciduous and evergreen trees, with the latter being more predominant. Notably, the trees in this area reach heights exceeding 55 meters, forming a semi-closed canopy with stratified tree crowns (KNP-GMP 2015-2025). The undergrowth is characterized by sparse vegetation, including shade-tolerant herbs and shrubs such as *Palisota schwenfurthii*, *Polia condensata*, various ferns, and broad-leaved forest grasses.

Additionally, there is a dense growth of *herbaceous* and non-woody vegetation, prominently featuring *Acanthus* spp. This dense growth occurs in the more open secondary forest in the northern part of KNP, where selective felling practices were employed until 1969, resulting in the removal of large trees.

KNP consists of 351 tree species (28% of the Uganda's known trees species) according to Howard et al, 1996. In the north (> 1500 m altitude) *Parinari excelsa* dominates with *Strombosia scheffleri*, *Aningeria altissima*, *Newtonia buchananii*, *Olea welwitschii* and *Carapa grandifolia* as typical associates. In the centre (1200-1500 m altitude), the forest is mixed, dominated by *Chrysophyllum gorungosanum*, *Celtis africana*, *Markhamia platycalyx*, *Piptadeniastrum africanum*, *Newtonia buchananii*, *Chrysophyllum albidum* and *Diospyros abyssinica* with *Parinari excelsa* occurring in low numbers. In the south (1100-1200 m altitude) is dominated by *Olea welwitschii*, *Pterygota braedii* and a mixture of *Lovoa swynnertonii*, *Diospyros abyssinica* and *Markhamia platycalyx* forests.

Pure stands of ironwood (*Cynometra alexandria*) occupy the southern river valleys and lower altitudes with *Pandanus* spp., *Celtis durandii*, *Celtis africana*, *Diospyros abyssinica* and *Warbugia ugandensis* sparsely present. The flat terrain which is often flooded has thick stands of palms including *Phoenix reclinata*, *Raffia* and Screw Palms (Howard, 1991). Most species occur elsewhere in Uganda. However, some are noteworthy because their occurrence in Kibale is part of a limited range in western Uganda, e.g., *Elaeophorbia* spp., *Cola congolana*, *Tabernaemontana odoratissima* and *Hannoa longipes*. Non-timber trees of economic importance include wild robusta coffee (*Coffea canephora*) (Langdale Brown et al., 1964; Kingston, 1967; Osmaston, 1959; Wing and Bus, 1970; Kasenene, 1987; Howard, 1991). Endangered timber species include *Milicia excelsa*, *Cordia millenii*, *Entandrophragma angolensis* and *Lovoa swynnertonii* (KNP-GMP 2015-2025).

The project footprint vegetation

The intended location for the proposed canopy walk is situated within a designated Tourism Zone, providing opportunities for activities like forest walks, chimpanzee tracking (which is still in the habituation process), and bird watching. The site is equipped with a network of forest trails, forming part of the tourism infrastructure that facilitates various activities at Sebitoli. However, the open forest trail within the direct footprint and the Area of Interest (Aoi) is recognized as an activity that has led to gaps in the forest floor, particularly within the secondary/regenerating forest patches.

The proposed site consists of two vegetation assemblages, namely the *Albizia grandibracteata* community within the old sawmill area with undergrowth comprising *Datura suaveolens* and *Cestrum nocturnum*. This particular site was impacted by logging in 1969, and was not subjected to replanting efforts but rather allowed to undergo natural recovery.

The *Albizia* community forms a continuous expanse, evolving into primary forest as one progresses towards the west at the proposed canopy walk project site. This forested area is distinguished by a canopy cover

ranging from 85 - 95% of *Olea welwitschia*, *Uvariopsis congensis*, *Milicia excelsa*, *Croton megalocarpus*, *Alangium salviifolium*, *Aphania senegalensis*, *Prunus africana*, *Diospyros abyssinica*, *Rauvolfia vomitoria*, *Funtumia africana*, *Tabernaemontana holstii*, *Vepris nobilis*, *Maesopsis eminii*, *Markhamia lutea*, *Zanthoxylum gillettii* *Celtis africana*, and *Celtis durandii* as the common tree species. This patch was planted with *Olea welwitschia*, *Prunus africana* and a few other species. The site has since recovered to nearly climax community.

The other plant species within this project section include *Asplenium hypomelas*, *Begonia ampla*, *Cassipourea molasana*, *Celtis gomphophylla*, *Celtis zenkeri*, *Chaetacme aristata*, *Clausena anisata*, *Cordia millenii*, *Cordia abyssinica*, *Croton macrostarchys* *Culcasia scandens*, *Cyathula prostrata*, *Desmodium adescendens*, *Dictyandra arborescens*, *Diospyros abyssinica*, *Dombeya wallichii*, *Dovyalis macrocalyx*, *Drypetes gerrardii*, *Euadenia eminens*, *Glyphaea brevis*, *Gymnanthes leonardii-crispi*, *Hillieria latifolia*, *Lepidotrachilia volkensii*, *Leptaspis zeylanica*, *Maesa lanceolata*, *Oplismenus hirtellus*, *Palisota manii*, *Palisota schwenfurthii*, *Pancovia turbinata*, *Piper betle*, *Piper capensis*, *Piper umbellatum*, *Polia condensata*, *Scadoxus multiflorus*, *Solanum mauritianum*, *Spathodea campanulata*, *Tabernaemontana pachysiphon*, *Trema orientalis*. *Argomuellera macrophylla*, *Cassipourea molasana*, *Cordia superba*, *Craterispermum laurinum*, *Culcasia scandens*, *Desmodium adescendens*, *Dictyandra arborescens*, *Dombeya mukole*, *Drypetes gerrardii*, *Erythrina abyssinica*, *Euadenia eminens*, *Ficus exasperata*, *Momordica foetida*, *Neoboutonia macrocalyx*, *Paullinia pinnata*, *Pennisetum purpureum*, *Platyserium elephantotis*, *Pouzolzia parasitica*,

The project's area of influence includes a primary forest that encompasses all four layers of a climax forest: the forest floor, the understory, the canopy, and the emergent layer. Additionally, the area comprises regenerating forest, bushland, woodland, and the *Albizia* community (Figure 4-). The common species within this project landscape are presented in Appendix 2(a). Further downstream of the site, approximately 250 to 300 meters away, there is a streamside bushland with *Papyrus* at the edge of the regenerating forest. The main entrance features bushed grassland, primarily dominated by *Pennisetum purpureum*.



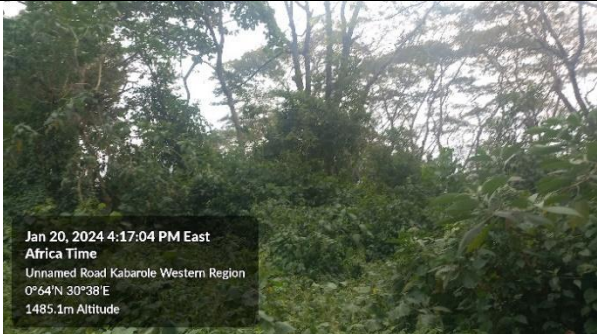
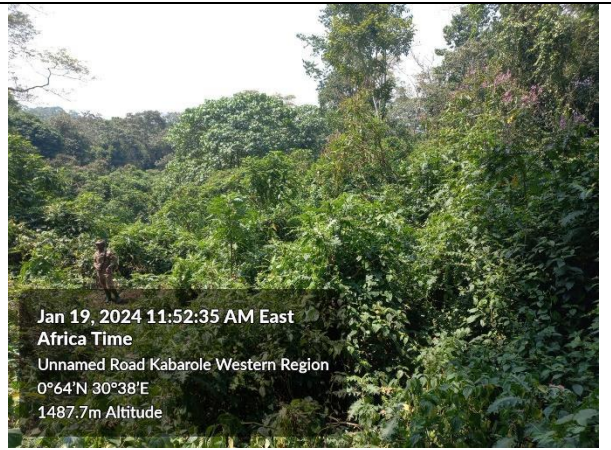
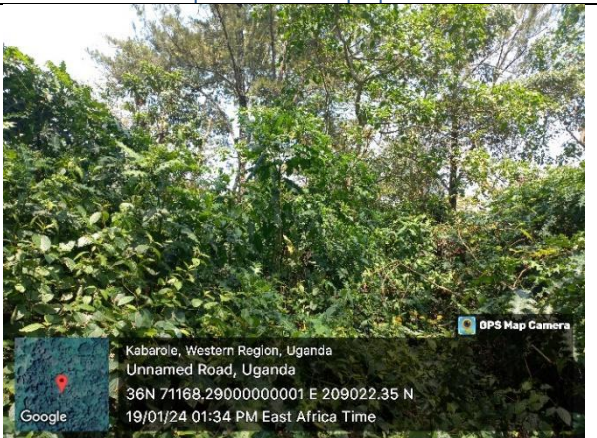
Forest at 85% canopy cover, part of the project site  Dense woodland edge of forest dominated by <i>Albizia grandibracteata</i> and <i>Dutara suaveolens</i>	Forest-woodland mosaic formerly utilized as sawmill, part of project site  Forest floor with 80% canopy cover part of the project site
 Well stocked forest patch with the proposed site	 Forest-woodland mosaic at edge of the canopy walk site
 Forest/woodland mosaic at edge of the project site	 Dense woodland dominated by <i>Albizia</i> at edge of project site beside the current accommodation facility



Figure 4-1: Pictorial view of vegetation assemblages at the proposed site and neighborhoods

Plant Species Richness

A comprehensive survey of the area documented 220 plant species. Among these, 133 species were identified within the direct footprint for the proposed Canopy Walk, while 207 were observed in the project

area of influence (indirect footprint). The recorded species belonged to 164 genera and 74 families. Notably, the primary and nearly climax forest patches in the project area, where the installation will be situated, exhibited lower species richness compared to the regenerating forest patch, as well as the mosaic landscapes of bushed grassland, bushland, and woodland/bushland in the immediate site surroundings.

The *Albizia* community, partially impacted by the project footprint, displayed a lower diversity of species at the canopy level but a relatively higher abundance of species at the floor/understory level. This contrasted with the closed canopy of the climax and nearly climax forest patches, characterized by a more open understory and forest floor. Appendix 2 (a) presents a detailed list of the plant species recorded in the project area.

In the context of family distribution, the specific project footprint documented a lower number of plant species. In general, both the project area of influence and the direct footprint observed 17 species from the *Moraceae* family, making it the most prevalent. Following closely was the *Euphorbiaceae* family with 16 species, while the *Ulmaceae*, *Fabaceae*, and *Asteraceae* families each recorded 10 species. The *Poaceae* family documented eight (8) species, as outlined in Table 4-2 below.

Table 4-2: Distribution of plant species recorded from the project area according to plant family

Family	No. of Sp	Family	No. of Sp	Family	No. of Sp	Family	No. of Sp
Acanthaceae	5	Casuarinaceae	1	Melastomataceae	1	Polypodiaceae	2
Amaranthaceae	2	Chrysobalanaceae	1	Meliaceae	2	Ranunculaceae	1
Amaryllidaceae	1	Commelinaceae	6	Melanthaceae	1	Rhamnaceae	3
Anacardiaceae	1	Connaraceae	1	Menispermaceae	1	Rhizophoraceae	2
Annonaceae	2	Convolvulaceae	4	Moraceae	17	Rosaceae	4
Apiaceae	1	Cornaceae	1	Myrsinaceae	1	Rubiaceae	9
Apocynaceae	5	Costaceae	1	Nephrolepidaceae	1	Rutaceae	6
Araceae	1	Cucurbitaceae	6	Olacaceae	4	Sapindaceae	7
Araliaceae	1	Cyperaceae	1	Orchidaceae	1	Sapotaceae	3
Araliaceae	1	Dryopteridaceae	1	Ornagraceae	1	Solanaceae	3
Arecaceae	1	Ebenaceae	2	Osmundaceae	1	Sterculiaceae	2
Aspleniaceae	3	Euphorbiaceae	16	Pandaceae	2	Tectariaceae	1
Asteraceae	10	Fabaceae	10	Passifloraceae	1	Thelypteridaceae	1
Balsaminaceae	1	Flacourtiaceae	2	Phyllanthaceae	2	Tiliaceae	1
Basellaceae	1	Hypodematiaceae	1	Phytolaccaceae	2	Ulmaceae	10
Begoniaceae	1	Lamiaceae	3	Pinaceae	1	Verbenaceae	2
Bignoniaceae	3	Lauraceae	1	Piperaceae	4	Zingiberaceae	2
Boraginaceae	5	Malvaceae	2	Poaceae	8		
Capparaceae	3	Marantaceae	1	Polygonaceae	1		

In terms of growth form distribution, there were 91 tree species altogether, 46 shrubby species and 42 herbaceous plant species as presented in Figure 4-2 below.

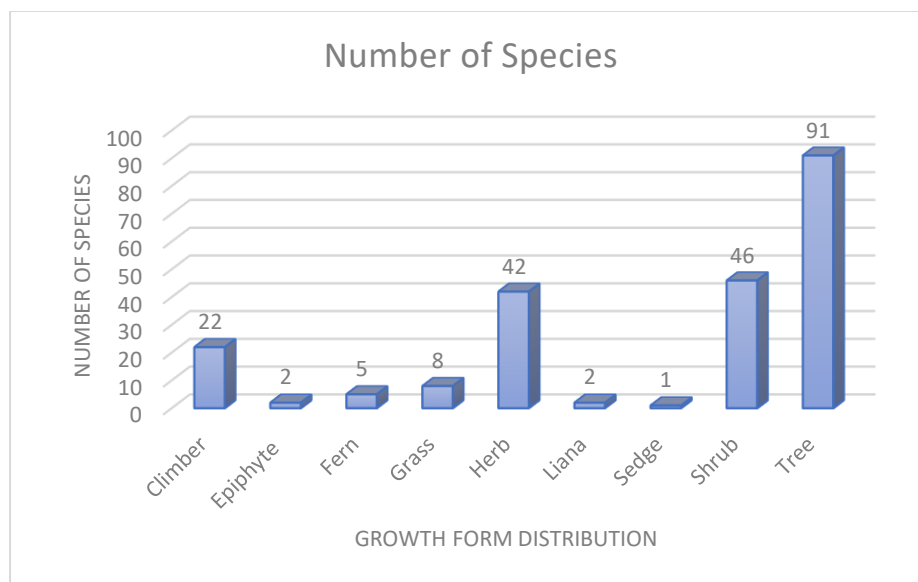


Figure 4-2: Growth form distribution of plant species recorded from the project landscape

The project footprint had fewer tree species because it is mainly dominated by *Olea welwitschia*, *Uvariopsis congestis*, *Prunus africana*, *Albizia grandibracteata*, *Milicia excelsa*, *Croton megalocarpus*, *Alangium salviifolium*, *Aphania senegalensis*, *Diospyros abyssinica*, *Rauvolfia vomitoria*, *Funtumia africana*, *Vepris nobilis*, *Zanthoxylum gillettii*, *Celtis africana*, *Celtis durandii* in tree layer and *Dutara saueolens*, *Allophylus cobbe*, *Cestrum nocturnum*, *Capparis erythrocarpos*, and *Acanthus arboreus* in shrubby layer.

The canopy cover within the project's direct footprint is dense, reaching up to 95% closure. In specific areas, such as within the *Albizia* community, the canopy exhibits a lower closure at around 70%. Outside the direct footprint of the project, the canopy cover varies significantly, influenced by the degree of forest establishment.

Species of conservation concern

Species of conservation concern as per the International Union for Conservation of Nature (IUCN) red list of threatened species were identified. The IUCN developed criterion for assessing and evaluating the conservation status of species, identifying, and documenting the species that are threatened, data deficiency and the least concern. In this system, species are evaluated against a series of objective criteria (available at www.iucn.org) and based on those criteria a species is placed in one of eight categories provided in Figure 4-3 below. Those species that fall within the Threatened and Near Threatened categories are Red listed and require rigorous conservation measures. Ministry of Tourism Wildlife and Antiquities (MTWA) also published a list of nationally threatened species in 2018 (MTWA, 2018) following the same criterion developed by IUCN.

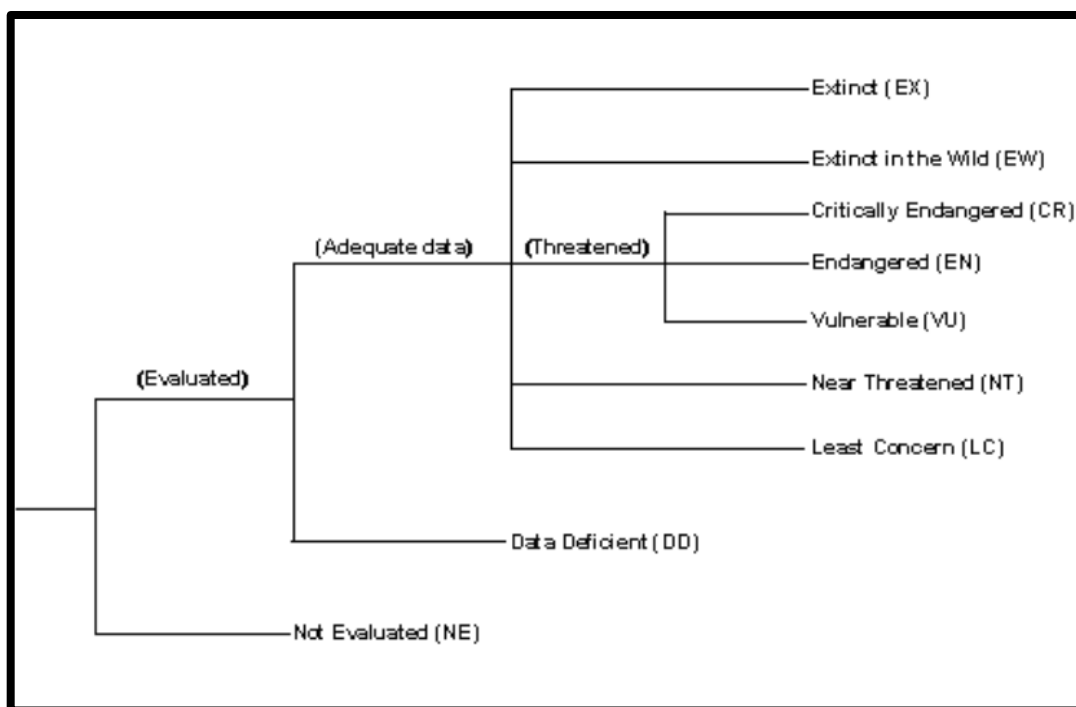


Figure 4-3: IUCN species categorization

Within the project footprint, two globally threatened plant species, namely *Prunus africana* (VU) and *Milicia excelsa* (NT), were identified. Conversely, the project footprint and its immediate neighborhoods recorded six plant species classified as nationally threatened, as detailed in Table 4-3 below. The National Park as a whole harbors various threatened species, although these specific species were not documented within the project site.

Table 4-3:- List of global and National threatened species recorded from the project site

Family	Species	Growth Form	IUCN status	National Status	No. in the Footprint	No. in the Non-Footprint
Sapotaceae	Aningeria altissima	Tree	CD	NA	1	1
Solanaceae	Dutara sauveolens	Shrub	EW	NA	1	1
Boraginaceae	Cordia millenii	Tree	LC	VU		1
Rutaceae	Zanthoxylum angolensis	Tree	LC	VU		1
Rutaceae	Zanthoxylum gillettii	Tree	LC	VU	1	1
Moraceae	Milicia excelsa	Tree	NT	EN	1	1
Rubiaceae	Mitragyna stipulosa	Tree	VU	VU		1
Rosaceae	Prunus africana	Tree	VU	VU	1	1

Aningeria altissima, documented at the project site, is a species classified as Conservation Dependent, and its continued existence relies on the extent of habitat conservation. Conversely, the understory of the *Albizia* community and a segment of the covered canopy adjacent to the *Albizia* community are primarily occupied by *Datura Sauveloens*. This plant species is reported to be Extinct in the Wild according to IUCN 2023. However, it being a native species to Brazil, it is considered an alien invasive species in Uganda and is neither threatened nor assessed in the country. Consequently, as it is exotic and invasive, it does not warrant conservation attention but should instead be managed as an invasive species within the landscape.

The project footprint is deemed crucial because of its protected status and the existence of endangered and rare plant and animal species. Nevertheless, the proposed activity is recognized as a contributor to sustainable resource management, generating essential revenue for the conservation of the protected area. Additionally, the proposed activity is environmentally friendly, with the assurance that all mature trees will be preserved. Any impact will be minimal, limited to trimming, and all construction materials will either be welded on-site or sourced from another location. Only pre-approved welded materials will be transported to the site for final assembly or installation.

Species protected by the Forestry and Tree Planting Regulations

Several plant species within KNP, as well as a few within the project footprint and its immediate surroundings, are designated as reserved or protected under the National Forestry and Tree Planting Regulation 2016. Table 4-4 presents the list of these reserved/protected species as outlined in Schedule 8 of the Regulation. Obtaining a permit from the Uganda Wildlife Authority (UWA), specified in schedule 9 of the Forestry and Tree Planting Regulation 2016, is necessary before felling any of these species.

Since the project is situated within a national park, and there are no extensive clearances planned except for a minimal few and mainly the saplings essential for project establishment, there is little concern about the protection of these species during project implementation. Additionally, it is noteworthy that the licensing body also serves as the developer.

Table 4-4: List of plant species protected under regulations 2016

Family	Species	Growth Form	IUCN status	National Status	Footprint	Non-Footprint
Fabaceae	<i>Albizia grandibracteata</i>	Tree	LC	NA	1	1
Boraginaceae	<i>Cordia millenii</i>	Tree	LC	VU		1
Moraceae	<i>Ficus asperifolia</i>	Shrub	LC	NA	1	1
Moraceae	<i>Ficus brachypoda</i>	Tree	LC	NA		1
Moraceae	<i>Ficus conraui</i>	Tree	LC	NA		1
Moraceae	<i>Ficus cyathistipula</i>	Tree	LC	NA		1
Moraceae	<i>Ficus exasperata</i>	Tree	LC	NA	1	1



Family	Species	Growth Form	IUCN status	National Status	Footprint	Non-Footprint
Moraceae	<i>Ficus mucoso</i>	Tree	LC	NA		1
Moraceae	<i>Ficus natalensis</i>	Tree	LC	NA	1	1
Moraceae	<i>Ficus ottoniifolia</i>	Tree	LC	NA		1
Moraceae	<i>Ficus sansibarica</i>	Tree	LC	NA		1
Moraceae	<i>Ficus saussureana</i>	Tree	LC	NA		1
Moraceae	<i>Ficus thonningii</i>	Tree	LC	NA		1
Moraceae	<i>Ficus trichopoda</i>	Tree	LC	NA		1
Moraceae	<i>Ficus vallis-choudae</i>	Tree	LC	NA		1
Rhamnaceae	<i>Maesopsis eminii</i>	Tree	LC	NA	1	1
Oleaceae	<i>Olea welwitschii</i>	Tree	LC	NA	1	1
Rutaceae	<i>Zanthoxylum angolensis</i>	Tree	LC	VU		1
Rutaceae	<i>Zanthoxylum gillettii</i>	Tree	LC	VU	1	1
Rutaceae	<i>Citropsis articulata</i>	Tree	NA	NA	1	
Moraceae	<i>Milicia excelsa</i>	Tree	NT	EN	1	1
Rubiaceae	<i>Mitragyna stipulosa</i>	Tree	VU	VU		1
Rosaceae	<i>Prunus africana</i>	Tree	VU	VU	1	1
Sapotaceae	<i>Aningeria altissima</i>	Tree	CD	NA	1	1

Invasive species

According to Kumar and Singh (2020), ecological concerns arising from biotic invasion pose a growing threat to global sustainability. Invasive Alien Plant Species (IAPS) play a significant role in biodiversity loss, leading to alterations in ecosystem services and socio-economic conditions through various mechanisms. Additionally, the invasive plants listed in Table 4-5 should not be considered a comprehensive list of all IAS with the potential to impact the project area due to canopy walk construction. This is because this list is limited by the availability and publication date of relevant literature and field encounters during baseline studies. Other IAS may be encountered within the Project Area of influence (Aol) during construction phase, if encountered; they should be subjected to risk assessment accordingly.

Table 4-5: List of known invasive species within the project footprint and project area of influence

Species	Known Distribution	Known Impacts	Relevant	Method of spread
<i>Chromolaena odorata</i> (Siam weed or Christmas bush) - shrub	ESIA surveys did not identify this species during the baseline data collection, but it has been recorded within the general landscape and especially in the districts of Kasese, Kazo and Kyenjojo though in low to medium abundance. The species is evenly distributed in Uganda	Invades and frequently dominates disturbed areas, grasslands, fallow areas, and forestry plantations.		Primarily by seed (persistence: 1(6) years, dispersal: generally, by wind but also by sticking to fur, feather, and clothes and in soil). Also stem layering.
<i>Mimosa pigra</i> (catclaw mimosa or giant sensitive tree) – shrub or small tree	ESIA surveys did not identify this species within the project footprint, but it is common in most disturbed moist habitats in Uganda	Regarded as one of the worst IAS of tropical Africa wetlands (REF), which it frequently comes to dominate, and alters open grasslands into dense thorny thickets, negatively impacting on native biodiversity. Can also dominate roadside verges.		Seeds (persistence: 2 years, dispersal: animal movement and in soil. Noted as being readily spread by construction equipment.
<i>Acacia hockii</i> (white thorn acacia) - shrub or small tree	This was not recorded within project footprint, but it is common within bushland and grazing land in the general landscape.	A native plant noted as being invasive in parts of Uganda for more than 50 years (REF) overgrazed grasslands and evergreen thickets. Presence of tall shrubs can prevent effective control of tsetse fly.		Seed (persistence: no information), dispersal: primarily by animals but also by water flow and in soil.
<i>Cassia siamea</i> (also <i>Senna siamea</i>) (Siamese cassia or kassod tree) - tree	Was not Identified during ESIA surveys at project footprint but it is common on community land and in urban centres surrounding the national park.	Unlikely to cause major impacts; however, it can be a nuisance weed in forest setting		Seeds (persistence: 'many years', dispersal: primarily water flow and possibly by animal).
<i>Lantana camara</i> (lantana or tick berry) - shrub	This was recorded within the project footprint. They have a potential to colonize disturbed sites. The species is found evenly distributed within Uganda especially across farmland, grazing land, wetland edges and forest edges of the	Forms extensive, dense, and impenetrable thickets in forestry plantations, orchards, pastureland, waste land and in natural areas (including protected grasslands and woodlands and forest		Seeds (persistence: 11 years, dispersal: primarily by birds and by water flow) and by adventitious shoots.

Species	Known Distribution	Known Impacts	Relevant	Method of spread
	Project area. This species is widely distributed in Uganda	gaps). Poisonous to livestock.		
<i>Solanum mauritianum</i> (tobacco tree) - shrub or small tree	This species is scattered in project area especially in open forest patches and it was recorded at forest edge and open areas	Invades natural forests, forestry plantations, riparian zones, urban open space, and various disturbed areas, displacing native vegetation, hindering commercial forestry activities, harbouring agricultural pests, poisoning livestock, and providing health risks for humans		Seed (persistence: not long lived, dispersal: birds, bats, monkeys, and human activity) and, more commonly, by adventitious roots.
<i>Parthenium hysterophorus</i> (Parthenium weed) – annual herb	This species was not recorded within the project site and its immediate environment but it common on fallow lands within the district of Kabarole and Kamwenge	Infestations are responsible for declines of 40% in food-crop yields, and reductions of 90% in livestock carrying capacities of some grassland areas. Contains potent allergens that can cause severe ailments in grazing and browsing animals, while also inflicting on people discomforting conditions such as dermatitis, asthma, hay-fever, breathing difficulties (potentially leading to death) and irritations of the eyes. Greatly reduces biodiversity in a range of habitats including savanna and open woodland.		Seeds (persistence: 6 years, dispersal: wind, water, farm machinery, industrial machinery, animals, humans, vehicles, stock fodder, and movement of stock, grain, and seed).
<i>Senna spectabilis</i> (white barked senna) – tree	This species is common within the project landscape and has a bearing on displacing indigenous species especially in Matiri central forest reserve.	Poses a high risk to native flora (and dependent fauna) in Uganda. Out-competes and replaces whole communities of native		Seeds (persistence: 3 years, dispersal: gravity, water flow and in soil) primarily, but also adventitious roots and by plant cuttings.
			86	

Species	Known Distribution	Known Impacts	Relevant	Method of spread
	The species is common within the country.	forest plants. Leaves unpalatable.		
<i>Broussonetia papyrifera</i> (paper mulberry) – tree	This species was not recorded from the project corridor, but it is common in Uganda	Spreads rapidly through forest reserves and adjoining farmland and pastures, reducing biodiversity and impacting rural livelihoods.		Seed (persistence: no data, dispersal: birds, small animals, water flow and in soil), stem cuttings, coppice and root suckers.
<i>Cymbopogon nardus</i> (citronella grass) – grass	Common in grassland and open woodland of the project area	Invades range lands and affects plant species composition, lowering the quality and yield of forage. Unpalatable to bovines. May constitute a threat to biodiversity in Uganda national parks.		Seed (persistence: no data, dispersal: wind, animals, water, machinery, and road vehicles) and via vegetative clumps.
<i>Datura suaveolens</i>	The species is common within the project site.	The species invades tropical rain forest edges establishing itself as a mono plant on the forest edges		

Sensitive habitats along the project corridor

A location is deemed sensitive if it encompasses a delicate watershed, riparian community, and rare or threatened species of plants and animals. In light of this definition, both the forest fragment and the entire KNP play a crucial role in conserving plant, bird, and mammal species that are classified as vulnerable and endangered and therefore regarded as sensitive.

4.2.2 Fauna

Mammals assessment approaches

The mammal assessment utilized a comprehensive approach incorporating various methods. Initially, walked transect surveys were conducted to observe mammals or signs of their presence, such as nests, tracks, footprints, fecal material, or feeding signs. Subsequently, camera traps were strategically deployed to passively monitor mammal presence. Additionally, interviews with members of the Ranger force provided valuable information on known mammals in the area.

In the first approach, mammals were surveyed in and around the proposed project area through walked transects covering the project area and its surroundings. During these walks, physical observations were made to identify live encounters or spoor (Tracks and signs, including dung, footmarks, feeding signs, roosts,

etc.) of mammals. Any live species and their spoor were documented, and GPS points were recorded to note the locations of the observed species.

Primate groups were enumerated and recorded, with no physical presence of Chimpanzees observed, although three recent nests were identified and documented.

Furthermore, 15 camera traps were strategically placed in the proposed project area and its surroundings, left in place for 5 days. The cameras were recovered on the last day of the surveys, and the recorded photos were reviewed to identify the species captured.

All recorded species were cross-checked against MTWA (2018) to assess their conservation status using the threat categories outlined below: -

- CR Critical (Globally (G-CR) or Regionally (R-CR))
- EN Endangered
- VU Vulnerable
- NT Near threatened
- RR Regional Responsibility

The KNP has a reported at least 60 species of mammal (Wilson 2005). Subsequent studies and perhaps also taxonomic revisions in recent years may change this number to several more species. For example, Off & Gebo (2005) reported their study on two Galago species including *Galago matschiei* that at the time was not listed for KNP.

Results of the fauna assessment

A combination of approaches (observation, searching for signs, interviews with rangers and Camera trapping) were used to establish the diversity of mammals in and around the proposed project area. The surveys for this report, established the occurrence (or potential occurrence) of 20 species belonging to 7 mammal families. In Table 4-6 the *Cercopithecoid* primates were the more visible mammals, observed foraging in and around the project area.

Table 4-6: Mammal species recorded in the proposed project area

Order	Family	Species	Evidence
Primate	Pongidae	Common Chimpanzee <i>Pan troglodytes</i>	Nests, fecal & Interviews
	Cercopithecidae	Black and White Colobus <i>Colobus guereza</i>	Foraging groups and Camera trap
		Red Colobus <i>Piliocolobus badius</i>	Foraging groups
		Red Tailed Monkey <i>Cercopithecus ascanius</i>	Foraging groups
		Olive Baboon <i>Papio Anubis</i>	Foraging groups
		Grey-cheeked Mangabey <i>Lophocebus albigena</i>	Foraging groups
		Vervet Monkey <i>Chlorocercus pygerythrus</i>	Interviews
Artiodactyla	Elephantidae	Elephant <i>Loxodonta africana</i>	Dung, Trails, Audio and Camera trap
	Bovidae	Bushbuck <i>Tragelaphus scriptus</i>	Camera trap and Dung
		Black fronted Duiker <i>Cephalophus nigrifrons</i>	Camera trap and Dung
		Blue Duiker <i>Philantomba monticola</i>	Camera trap and Dung
		Bush Duiker <i>Sylvicapra grimmia</i>	Camera trap
		Buffalo <i>Syncerus cafer</i>	Interviews
	Suidae	Bushpig <i>Potamochoerus porcus</i>	Interviews
		Giant Forest hog <i>Hylochoerus meinertzhageni</i>	Interviews
	Herpestidae	Banded Mongoose <i>Mungos mungo</i>	Interviews
		Marsh Mongoose <i>Atilax paludinosus</i>	Camera trap
Carnivora	Viveridae	Servaline Genet <i>Genetta genetta</i>	Camera trap
	Felidae	Leopard <i>Panthera pardus</i>	Interviews
		Serval <i>Leptailurus serval</i>	Interviews

Bushbucks and Blue Duikers showed a day and as well night activity patterns. The primates all showed diurnal activity patterns. The only record of Elephants on Camera was during the day, although other observations from their fresh dung and trails also indicated nocturnal activity. Eight species that were not physically observed were recorded on Camera trap in the proposed project area (Figures 4-4, 4-6, 4-7 and 4-8).

The assessment of deployed equipment (cameras) indicates that the recorded species frequently utilize the project area. However, it remains unclear whether they exist in substantial populations in the vicinity. The observed ungulates in nature are typically solitary or found in small family groups of no more than four. A key

observation is the prevalence of elephant trails crisscrossing the area, indicating a recurrent movement of the species into this region.

The engagement with the park rangers at Sebitoli indicated the occurrence of a Red Forest Duiker (*Cephalophus natalensis*) – Kingdon (2016) and several other sources suggest that this species range does not enter into Uganda. The Duiker photo captured fits more the Black-fronted Duiker *Cephalophus nigrifrons* to which is attributed to the species during the assessment. The photos captured were all quite dark and therefore it may be necessary to conduct a much longer camera trapping campaign in the project area to confirm this identity.



Figure 4-4: Bush back species



Figure 4-5: Duiker species



Figure 4-6: Bush duiker and genet

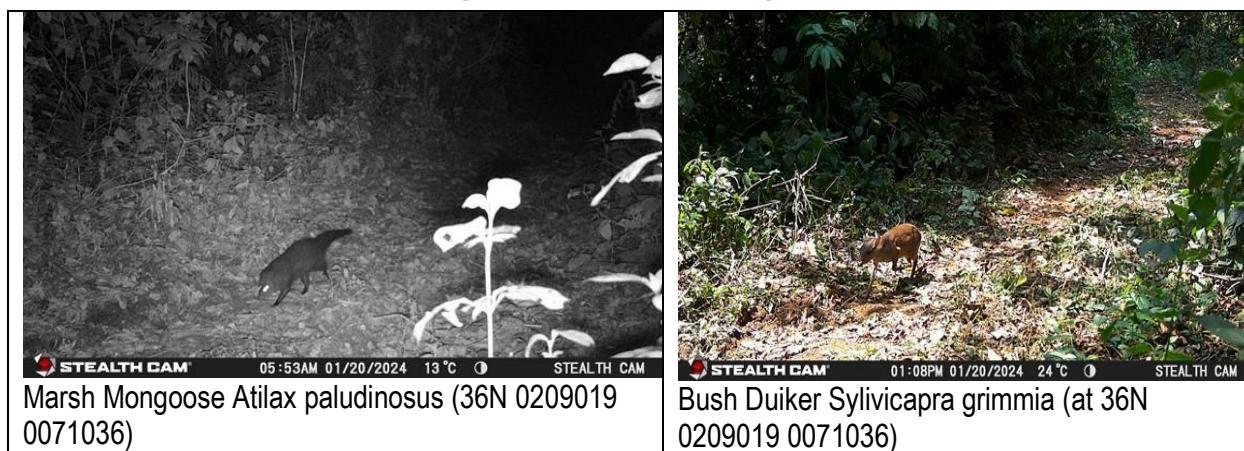


Figure 4-7: Mongoose and bush duiker



Figure 4-8: Baboon and Elephant

Species of Conservation Concern

Five threatened mammal species, with two of them (Leopard and Giant Forest Hog) were reported to be present in the area (Table 4-7), yet no direct evidence of their occurrence was observed. The evidence for the other three species was mainly obtained through camera traps. The conservation concern categories for all these species are determined based on MTWA (2018), and it is possible that these species may warrant classification as critical habitat. However, there is no evidence of critical resources essential for their existence and survival in the project area. Therefore, it is believed that the proposed project area constitutes only a portion of their broader range. Two of the species were listed by Carswell et al (2005) as of regional responsibility, two as Regionally Near threatened and one as regionally Vulnerable. The more recent assessment in MTWA (2018) suggests these threat categories were since overtaken.

Table 4-7: Species detected during the ecological assessment

Class	Species common and scientific name	Global Status	Nationality	Presence in the Canopy Walk (CE, E, V)* (Likely/unlikely)
Mammalia	Common Chimpanzee <i>Pan troglodytes</i>	E	E	P
Mammalia	Elephant <i>Loxodonta africana</i>	V	CE	P
Mammalia	Black fronted Duiker <i>Cephalophus nigrifrons</i>	LC	V	P
Mammalia	Leopard <i>Panthera pardus</i>	V	V	P
Mammalia	Giant Forest hog <i>Hylochoerus meinertzhageni</i>	LC	E	P

*P=present; E=Endangered; V=Vulnerable; CE=Critically Endangered; LC=Least Concern

4.2.3 Avifauna

Assessment approaches

Viewed from the perspective of avifaunal assessment, it was recognized that the proposed project would involve minimal vegetation clearance for the installation of the walkway and its supporting infrastructure. To align with the spatial scope of the proposed project area, survey methods were adjusted accordingly. The surveys employed the transect count method, involving the placement of two transects—one encircling the immediate project area and the other commencing from the proposed project area and extending into the forest across the Fort Portal - Kampala Road.

During the transect walks, all bird species observed or heard were identified and documented, with the recorded numbers noted. Flying birds were also observed and counted, particularly as they were presumed to be utilizing the habitat. Bird identification was carried out using the standard field guide reference book titled "A Field Guide to the Birds of East Africa" by Stevenson and Fanshawe (2002).

Habitat Classification

Birds recorded were all classified into habitat preference categories, based on Bennun and Njoroge (1996), Wilson (2005) and Carswell et al. (2005). The categories listed the birds as belong to any one of the following:

-

- FF - Forest specialist (species of typical forests interior)
- F - Forest generalist (species less specialized also occur in small patches of forests)
- G – Grassland species
- f - Forest visitor
- W - Water specialist (Wetland specialist)
- w - Water non-specialist (Wetland visitor)
- Ae – Aerial feeder
- A - Afro-tropical migrants (a species migrating within Africa)
- P - Palearctic migrants (a species which breeds in Europe or Asia)
- p - Species with at least some Palearctic populations

Migratory classifications

The birds recorded were also assessed to establish if any had migratory tendencies following the Uganda Bird atlas (Carswell et al. 2005). Two categories of migrant species checked for were:

- Afro-tropical migrants
- Pale-arctic migrants

Conservation status of recorded birds

All birds recorded were assessed for conservation concern based MTWA (2018) for both the Global and National level conservation concerns, but also the Regional Conservation Concern based on Carswell et al (2005) to assess if any species belonged to any of the following categories: -

- CR Critical (Globally (G-CR) or Regionally (R-CR))
- EN Endangered
- VU Vulnerable
- NT Near threatened
- RR Regional Responsibility

Avifaunal Assessment results

The KNP was previously documented to host up to 371 bird species (Wilson 1995). Conversely, the KNP General Management Plan (2015-2025) estimates the richness of bird species to be at least 372. The Environmental and Social Impact Assessment (ESIA) surveys identified a total of 102 bird species in the area, constituting approximately 30% of the overall avian diversity within KNP. The majority of bird species recorded were at low levels of regularity. Table 4-8 lists 7 species that were encountered at least 6 times in

	93

the transect count that was conducted. All species recorded except for 11 (Appendix 2 (C)) were species of forest interior habitat preference or at the very least resident in or near forest. The table below details the information of the assessment.

Table 4-8: Species of birds encountered at relatively high levels of regularity.

Atlas Number	Species	R/A	Notes	EA-Threat	Habitat
372	Great Blue Turaco <i>Corythaeola cristata</i>	6	RB		F
503	White-headed Woodhoopoe <i>Phoeniculus bollei</i>	7	RB		FF
533	Gray-throated Barbet <i>Gymnobucco bonapartei</i>	14	RB		F
701	Yellow-whiskered Greenbul <i>Andropadus latirostris</i>	8	RB		F
911	White-chinned Prinia <i>Prinia leucopogon</i>	6	RB		F
1058	Purple-headed Starling <i>Lamprotornis purpureiceps</i>	9	RB		F
1069	Narrow-tailed Starling <i>Poeoptera lugubris</i>	10	RB		FF

Since forest birds may be missed if they remain quiet and/or don't fly around, the relative abundance may simply just be indicative of levels of activity of the birds recorded in the survey period. Other survey methods can add to the species record in an area, for example the Crested Guinea Fowl (Figure 4-9 below) that was not recorded on the transect counts, was recorded on camera.



Figure 4-9: Crested Guinea Fowls *Guttera pucherani* (at 36N 0209019 0071036)

Avifaunal species of conservation concern

Two of the species in Table 4-9 (were listed by Carswell et al (2005) as of regional responsibility, two as Regionally Near threatened and one as regionally Vulnerable. The more recent assessment in MTWA (2018) suggests these threat categories were since overtaken.

Table 4-9: Bird species of Conservation Concern

Atlas Number	Species	R/A	Notes	EA-Threat	Habitat
403	Black Cuckoo <i>Centropus grilli</i>	1	RB	R-NT	Af/FF
488	Cinnamon-chested Bee-eater <i>Merops oreobates</i>	4	RB	R-RR	F
699	Little-grey Greenbul <i>Andropadus gracilis</i>	1	RB	R-NT	FF
719	Toro Olive-Greenbul <i>Phyllastrephus hypochloris</i>	2	RB	R-VU/RR	FF
875	Gray-capped Warbler <i>Eminia lepida</i>	2	RB	R-RR	fWW

Key to acronyms: R/A e-relative abundance; RB – Resident Breeder; R-NT – regionally near-threatened; R-RR – species of regional responsibility; R-VU – regionally vulnerable; Af – intra-African; f – resident in and near forests; FF – Forest resident; WW – always resident in or near water

4.2.4 Herpetofauna assessment

Approaches

The baseline survey employed three primary approaches, namely:

1. Literature Review: To comprehend the project area and establish the known herpetofauna, literature was thoroughly examined.
2. Informal Community Consultation: During field sampling, the herpetofauna expert informally consulted UWA rangers and other Sebitoli Tourism Sector Offices staff. This aimed to document information on herpetofauna availability not obtainable during field sampling. Discussions revolved around herpetofauna species occurring in and around the project area.
3. Field Sampling: Conducted using scientifically tested methods and international best practices, field sampling followed methodologies described by Heyer et al. (1994), Fellers and Freel (1995), Halliday (1996), and Olson et al. (1997). Techniques included:
 - *Visual Encounter Surveys* (VES): Moving through the study area to observe and record surface-active herpetofauna species. VES were complemented by visual searches under logs, leaf litter, vegetation, and crevices. Encountered species were recorded and, when possible, photographed.
 - *Audio Encounter Surveys* (AES): Identifying amphibian species through species-specific calls, sounds, or advertising calls made by breeding males. The identity and numbers of heard amphibian species were recorded.
 - *Opportunistic Encounters*: Recording herpetofauna species encountered opportunistically while moving within the project area.

Collected information underwent analysis by:

- Compiling a species checklist.

Determining species conservation status using the IUCN 2022 published Red List of threatened species and the 2016 National Red List for Uganda published by the Wildlife Conservation Society.

There were 26 sampling points surveyed for herpetofauna data. Their distribution in and around the proposed canopy walkway project area in KNP is shown in Figure 4-10.



Figure 4-10: Showing sampling points where Herpetofauna data was collected.

Herpetofauna Assessment Results

A total of eight amphibian species were recorded (refer to Table 4-10 below). Among them, one belonged to the toad category, while the remaining seven were identified as frogs. These species were observed in proximity to water sources, including water pools and the Papyrus swamp situated in the valley points to the southern side of the Sebitoli canopy walk. The recorded amphibian species span four families and four genera. Given their secretive nature, compiling a comprehensive species list for the project area needs considerable time.

Table 4-10: Amphibian species recorded during the survey of the canopy walk project area

Family	Species Scientific and Common Name	Global IUCN Red List Status	Nationally IUCN Red List Status	Presence in the Canopy Walk (Likely / Unlikely)
Bufonidae	<i>Sclerophrys kisoensis</i> Kisolo Toad	LC	LC	Unlikely
Hyperoliidae	<i>Hyperolius kivuensis</i> Kivu Reed Frog	LC	LC	Unlikely
Hyperoliidae	<i>Hyperolius cinnamomeiventris</i> , Cinnamon-bellied Reed Frog	LC	LC	Unlikely
Hyperoliidae	<i>Hyperolius viridiflavus</i> Common Reed Frog	LC	LC	Unlikely
Phrynobatrachidae	<i>Phrynobatrachus uratus</i> Golden Puddle frog	LC	LC	Unlikely
Phrynobatrachidae	<i>Phrynobatrachus graueri</i> Grauer's Puddle Frog	LC	LC	Unlikely
Phrynobatrachidae	<i>Phrynobatrachus natalensis</i> Natal Puddle Frog	LC	LC	Unlikely
Pyxicephalidae	<i>Amietia angolensis</i> Angola River Frog	LC	DD	Unlikely

*P=present; E=Endangered; V=Vulnerable; CE=Critically Endangered; LC=Least Concern, DD=Data Deficient

There is no indication that many of the amphibians and reptiles documented in Kibale Forest by previous expeditions and surveys could not also be found in and around the Sebitoli Tourism sector areas. These findings support the likelihood that dedicating more time to the survey in the Sebitoli Canopy Walkway area could lead to the discovery of additional amphibian and reptile species.

The survey did not identify any species of conservation significance. All encountered species are classified as least concern according to the 2020 IUCN Red List of threatened species. The IUCN considers these species to be widespread and common across much of their range (Rödel, 2000). The Angola River Frog (*Amietia angolensis*) is classified as data deficient (DD) by the National Red List for Uganda (WCS 2016).

Reptiles

The survey of the Sebitoli Canopy Walkway site and surroundings identified Six reptile species (refer to Table 4-11). These comprised four snakes, one lizard, and one skink, representing six families and six genera. The ratio of recorded families to recorded genera serves as an indicator of the reptile fauna's diversity in the Sebitoli Tourism Sector. Only two species were visually confirmed, namely the *Acanthocercus atricolis* Blue Headed Tree Agama and *Bitis arietans* Puff Adder. The UWA Rangers reported all snake sightings within the vicinity of the Sebitoli Tourism Sector infrastructure areas. While the presence of a chameleon was also reported by the UWA Rangers, the provided descriptions were insufficient for the herpetofauna specialist to ascertain its identity.

Table 4-11: Reptile species recorded during the survey of the canopy walk project area

	97

Family	Species Scientific and Common Name	Global IUCN Red List Status	Nationally IUCN Red List Status	Presence in the Canopy Walk (Likely / Unlikely)
Agamidae	<i>Acanthocercus atricolis</i> Blue Headed Tree Agama	LC	LC	Unlikely
Colubridae	<i>Dispholidus typus</i> Boomslang	LC	LC	Likely
Elapidae	<i>Naja nigricollis</i> Black-necked Spitting Cobra	LC	LC	Likely
Pythonidae	<i>Python sebae</i> Central Africa Rock Python	LC CITES Appendix II Listed	LC CITES Appendix II Listed	Unlikely
Scincidae	<i>Trachylepis striata</i> Striped Skink	LC	LC	Unlikely
Viperidae	<i>Bitis arietans</i> Puff Adder	LC	LC	Likely

*P=present; E=Endangered; V=Vulnerable; CE=Critically Endangered; LC=Least Concern

None of the recorded species hold conservation significance, as they are all categorized as Least Concern (LC) according to the IUCN 2020 Red List of threatened species. The Central Africa Rock Python (*Python sebae*) is classified under the Endangered Species Decree of 1985, indicating a prohibition on its international trade. Although listed under CITES Appendix II (Branch 1998), in Uganda, the species has been downgraded from Appendix II due to its continued abundance and widespread presence in the country. Figure 4-11 shows common reptiles recorded during ESIA.



Figure 4-11: Captured *H. cinnamomeiventris* and *A. atricolis* in the study area

Habitat and potential project area distribution and ecology○ **Amphibians**

Table 4-12 below displays the habitat and potential distribution ecology of the amphibians encountered in the project area.

Table 4-12: Habitat for the recorded amphibians and their general distribution ecology

Species Scientific and Common Name	Habitat	Potential project area distribution ecology
<i>Sclerophrys kisoensis</i> Kisolo Toad	Forest interior	Forest leaf litter and swamp forest areas. Can also be encountered in agricultural areas outside the forest. Feeds on insects and reproduces in aquatic environments
<i>Hyperolius kivuensis</i> Kivu Reed Frog	Forest Interiors and Forest edge or openings	Arboreal and normally encountered in lower vegetation. Eggs are layed on vegetation hanging above water. The tadpoles fall in water and grow in the aquatic environment.
<i>Hyperolius cinnamomeoventris</i> , Cinnamon-bellied Reed Frog	Forest Interiors and Forest edge or openings	Arboreal and normally encountered in lower vegetation. Eggs are layed on vegetation hanging above water. The tadpoles fall in water and grow in the aquatic environment
<i>Hyperolius viridiflavus</i> Common Reed Frog	Forest Interiors and agricultural areas outside forests	Arboreal and normally encountered in lower vegetation. Eggs are layed directly in water where tadpoles grow from.
<i>Phrynobatrachus uratus</i> Golden Puddle frog	Forest interior	Forest leaf litter and swamp forest areas. Can also be encountered in riparian or stream sides; Aquatic breeder
<i>Phrynobatrachus graueri</i> Grauer's Puddle Frog	Forest Interiors and Forest edge or openings	Forest leaf litter and swamp forest areas. Can also be encountered in Riparian or stream sides; Feeds on insects and Ants; and it's an aquatic breeder
<i>Phrynobatrachus natalensis</i> Natal Puddle Frog	Forest Interiors and Forest edge or openings	Forest leaf litter and swamp forest areas. Can also be encountered in Riparian or stream sides; Feeds on insects and Ants; and it's an aquatic breeder
<i>Amietia angolensis</i> Angola River Frog	Forest Interiors and Forest edge or openings	It's an arboreal species, encountered in swamp forests or valley bottoms

○ **Reptiles**

Table 4-13 below presents the habitat and potential distribution ecology of the reptiles encountered within the project area, as were depicted.

Table 4-13: Habitat for the recorded reptiles and their general distribution ecology

	99

Species Scientific and Common Name	Habitat	Potential project area distribution ecology
<i>Acanthocercus atricolis</i> Blue Headed Tree Agama	Forest edge or opening species which is also occur in agricultural areas outside forests.	It is an arboreal species which feeds on a variety of insects.
<i>Dispholidus typus</i> Boomslang	Forest Interiors, Forest edge or openings.	Both terrestrial and arboreal. Feeds on Birds and rodents
<i>Naja nigricollis</i> Black-necked Spitting Cobra	Forest Interiors, Forest edge or openings	Mainly terrestrial but can also be aquatic. Feeds on fish, amphibians and reptiles.
<i>Python sebae</i> Central Africa Rock Python	Forest Interiors, Forest edge or openings and also in agricultural areas outside forests	Terrestrial species but can also be aquatic. Feeds on Birds and general mammals.
<i>Trachylepis striata</i> Striped Skink	Forest edge or opening species which also occur in agricultural areas outside forests	Encountered under forest leaf litter and feeds on insects
<i>Bitis arietans</i> Puff Adder	Forest Interiors, Forest edge or openings and also in agricultural areas outside forests	Terrestrial species. Feeds on birds and small mammals

IFC PS6 related separation of habitat types

The 2019 version of the IFC Performance Standard (PS) 6 Guidance Note (GN) 26 intentionally offers a comprehensive definition of habitats, encompassing geographical units such as marine and freshwater aquatic areas, as well as airway passages. This definition marks a departure from the traditional ecological understanding of habitat as the specific place or type of site where an organism or population naturally exists. In the context of a development project, IFC PS6 recognizes the distinction between natural and modified habitats as an initial step in assessing the potential threats within a landscape.

The IFC PS6 defines modified, natural, and critical habitats based on the biodiversity value determined by species, ecosystems, and ecological processes. As part of the risk and impact identification process, the IFC PS6 mandates that the client creates and present a map illustrating the modified, natural, and/or critical habitats within the project's area of influence to assess the applicability of Performance Standard 6. In practical terms, natural and modified habitats exist on a spectrum ranging from untouched, pristine natural habitats to intensively managed modified habitats. In reality, project sites are often situated amid a mosaic of habitats with varying levels of anthropogenic and/or natural disturbance.

Clients bear the responsibility of accurately delineating the project site in terms of modified and natural habitat. This determination is based on the degree of human-induced disturbance (e.g., presence of invasive

species, pollution levels, extent of habitat fragmentation, viability of existing naturally-occurring species assemblages, resemblance of existing ecosystem functionality and structure to historical conditions, degree of other types of habitat degradation, etc.) and the biodiversity values of the site (e.g., threatened species and ecosystems, culturally significant biodiversity features, ecological processes essential for maintaining nearby critical habitats).

The IFC stipulates that the identification of natural habitat should rely on credible scientific analysis utilizing the best available information. This involves assessing and comparing current and historical conditions, incorporating local knowledge and experience. In cases where natural habitats are suspected, a comprehensive map indicating the location and extent of both natural and modified habitats should be part of the risks and impacts assessment. It's important to note that natural habitats should not be assumed to be untouched or pristine; rather, the majority of designated natural habitats likely have experienced some level of historical or recent anthropogenic impact. The key consideration is the degree of impact. If, in the professional judgment of a competent expert, a habitat still predominantly possesses the principal characteristics and functions of a native ecosystem(s), it should be classified as a natural habitat, regardless of some level of degradation, the presence of invasive alien species, secondary forest, human habitation, or other human-induced alterations.

On the other hand, modified habitats are areas that may have a significant proportion of plant and/or animal species of non-native origin or where human activity has substantially altered the area's primary ecological functions and species composition. Examples of modified habitats include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands.

Critical habitats are characterized by high biodiversity value, encompassing (i) habitat significantly important to Critically Endangered and/or Endangered species; (ii) habitat of significance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

In accordance with the IFC definition and considering the modest scale of the proposed 450-meter Canopy Walk project, a detailed analysis may not be deemed necessary, as typically required for larger investments targeting linear infrastructure developments. Therefore, a credible analysis to distinguish natural from modified habitat can be achieved by utilizing a forest storeyed restored and recovery change summary analysis as the foundation for this interpretation. The determination at the critical habitat level relies on biodiversity features such as those identified primarily through mammal surveys within the study area. Despite their identification, could mean that this being a park the fauna is moving within and may not be using the habitat. While classified as a critical habitat, it is already safeguarded by wildlife and environmental laws. It's important to note that, despite the modified and recovering nature of the Sebitoli zone in the park; no threats were detected, indicating that no further action may be necessary.

4.3. Physical environment

4.3.1 Landscape and Physical features

Most researchers describe KNP as being located in Western Uganda, positioned equatorially between 0° 13' to 0° 41' N and 30° 19' to 30° 32' E. Situated just 24 km east of the Rwenzori Mountains, the park takes the form of a lengthy, narrow strip running from north to south. At its southern extremity, it closely neighbors the Western Rift Valley escarpment, a mere 5.6 km away from the northern boundary of the Ruwenzori National Park. The predominant growth of the forest occurs primarily within the drainage basin of the Dura River, and to a lesser extent, within that of the Mpanga River. Both rivers eventually flow into Lake George. As they meander through the park, these two water bodies follow a gentle descent from approximately 1620 m in the northern part of the Reserve to about 1160 m in the south.

The KNP spans a broad altitudinal range, ascending from 1,110 m in the southern region to 1,590 m in the far north where the Canopy Walk is located in Sebitoli. The park encompasses undulating terrain on the primary Ugandan plateau, with drainage flowing in a southerly direction. The landscape of Sebitoli in KNP is a mesmerizing blend of contrasting elements, creating a unique and captivating scenic view. As the park adjoins tea estates and inhabited environments, a picturesque mosaic unfolds, seamlessly intertwining the greenery of tropical rainforests with the orderly rows of tea plantations. The transition from tea estates to the tropical rainforest is marked by a gradual shift, sometimes characterized by riparian changes. The combination of agroforestry practices in tea estates, with their meticulously manicured rows of tea plants, creates an overview of constant green that stretches out towards the park's boundaries. This integrated landscape provides a striking contrast to the untamed wilderness that lies beyond.

While in the tropical rainforest, the atmosphere changes dramatically. Towering trees with dense canopies form an overhead umbrella, casting dappled sunlight onto the forest floor. The air is thick with humidity, and the charismatic ecosystem of nature creates a uniquely intertwined environment. One of the remarkable features of this landscape is the interplay between the tea estates and the rainforest. At the park's edge, tea bushes mingle with the first trees of the forest, creating a transitional zone where the boundaries between man-made and natural environments blur. This harmonious coexistence exemplifies the delicate balance between conservation and human activities.

The inhabited environments of estates add a human touch to the scenery. Dotted amidst the greenery are small communities and estates, creating a harmonious fusion of continuous Hima into Mabale of Kyenjojo District, rural life, and the wild. This integration of human habitation with the park's surroundings provides a unique perspective on the coexistence of local communities and the diverse ecosystems within KNP. Thus overall, the landscape in Sebitoli in KNP is a captivating collage of ordered mixed mosaic, thriving tropical rainforests, and human settlements. This intricate tapestry showcases the beauty of nature and the symbiotic relationship between the cultivated and the wild, making it a truly enchanting destination for those seeking a harmonious blend of natural and cultural richness. The elevation across the proposed project area is generally low between 1453 – 1521 m.a.s.l respectively.

4.3.2 Geology

On a broader scale, the geology of Sebitoli is part of metamorphic and intrusive rocks that cover Buganda-Tooro, Karagwe-Ankolean and the Basement Complex. Many of the past and most recent studies describe the geology of the area as one consisting of various lithological units ranging from Proterozoic metamorphic complex groups to younger volcanics. The rocks in the area have been subjected to extensive weathering and erosion leading to the deposition of unconsolidated sediments and volcanics (Bahiru and Woldai, 2016). Rocks are predominant in the area, with the former being represented by paraschists and migmatized quartzites. The group in the area consists mainly of a sequence of psammitic and pelitic rocks unconformably overlies the Igara group (Reece, 1961). This Group has been classified into five formations including: the Lukiri mudstone, Isingiro conglomerate, Lubare quartzite, Kasyoha shale and Munyoni quartzite in the order of succession from bottom to top (ibidi). The current analysis considered the past records are they reported as geology consisting of Precambrian rock formations-sedimentary in origin; these have been strongly folded and sometimes metamorphosed. Prominent ridges of quartzite, schists and some hills within the park reveal layers of robust laterite. While in some other areas phyllites, intruded by amphibolites, gneiss and granites overlies these formations. Despite that, the area is mainly of the basement complex geology comprising of undifferentiated gneisses including elements of partly granitized and metamorphosed formations. Argillites with basal quartzites and amphibolites of the Buganda-Toro system forms part. A small area of the city is comprised of volcanic tuffs and lavas of the western rift valley system.

4.3.3 Soils

Soil is the loose surface material covering most of the earth's crust; it consists of inorganic particles and organic matter. The formation of soil follows a combined effect of physical, chemical, biological and anthropogenic processes acting on the parent material, e.g. weathering of consolidated or unconsolidated rock, and as such could be used to infer the geology of a given area. Approximately 90% of the park's area is covered by red ferritic soils, with roughly two-thirds being sandy clay loams in the north and one-third consisting of clay loams in the south. These soils, characterized by deep weathering and minimal horizon differentiation, demonstrate very low to moderate fertility. The remaining 10% features fertile eutrophic soil resting on a foundation of volcanic ash, notably around Mpokya and Isunga on the western periphery of the park (Howard, 1991; Kasenene, 1980). More specifically the Sebitoli area is apparent that the proposed project area is mainly capped with sandy and loamy soil; pointing to the argillaceous and arenaceous nature of the parent rocks. The soil is generally fine-grained, with a narrow grain size distribution.

4.3.4 Climate

Climate denotes the prevailing or average weather conditions of a location, influenced by temperature and meteorological fluctuations over time. Numerous factors contribute to climate, with rainfall and temperature being the most significant. Consequently, due to the considerable relief amplitude and the dynamic biodiversity across the landscape, the area experiences substantial climate variations. Thus far, Uganda's national development strategies for the Canopy Walk will be consistently applied, from establishment to decommissioning, ensuring resilience against climate-induced impacts that may negatively affect the project or the environment.

The precipitation in this locality is substantial and generally well-distributed throughout the year, the park undergoes distinct wet and dry seasons. The months of March to April and September to November typically witness higher rainfall compared to other periods. Moreover, the dry season in June-July tends to be more intense than the one in December-February. The average annual rainfall for Fort-Portal is approximately 1474.5 mm. However, in recent studies the estimated average temperature records around Fort Portal Town, located approximately 17–20 km from Sebitoli, indicate minimal temperature variation. The area receives 1500 - 2000mm of rainfall annually, and the mean annual temperature ranges from 12.5°C to 30°C. It experiences bi-annual rainfall seasons. However, due to the effects of global warming, rainfall has become unpredictable. Nevertheless, this has not significantly affected the livelihood of the area, and the climate remains conducive and suitable for tourism activities in the district. Moreover, temperature differences are observed between day and night and may be very high, with hot afternoons reaching up to 35°C and chilly nights dropping to 10°C. Current records reveal seasonal temperature fluctuations in the selected months, characteristic of the tropical landscape climate in Tooro. The cooler months align with the two wet seasons in the region, spanning from March to May and September to November each year. The annual pattern of rainfall illustrates the tropical rainforest climate in the region. Thus, throughout the project life, including Canopy Walk construction, operation, decommissioning, and rehabilitation, project activities will be influenced by the climatic conditions.

Table 4-14: Fort Portal climatic conditions by selected month

Month	January	August
Record high °C (°F)	34.67(94.41)	31.7(89.06)
Average high °C (°F)	29.46(85.03)	27.23(81.01)
Daily mean °C (°F)	24.27(75.69)	21.84(71.31)
Average low °C (°F)	14.57(58.23)	13.07(55.53)

Source: (online cited on 28 January 2024)

In general, the climate of KNP is tropical; with mean annual rainfall ranging from 1,100-1,700 mm. Rainfall is higher in the north than the south of KNP. Seasonal peaks are observed from March to May and from September to November. Annual mean temperature ranges from 14 -15°C minimum to 26-27°C maximum, with small daily variations. The park occupies undulating terrain on the main Ugandan plateau draining in a southerly direction.

4.3.5 Rainfall

In the past, rainfall averages concealed important variations between years in both the quantity and temporal distribution of rainfall, factors that are expected to have significant biological implications. For instance, there was notable year-to-year fluctuation in the amount of rainfall for any given month. Over a 14-year period, the coefficient of variation in monthly rainfall ranged from as low as 30.5% for October to as high as 88.3% for February. July exhibited the smallest range and the least standard deviation of rainfall between years. These records align with the general observation that rainfall variability tends to increase closer to the equator. In contrast, variations in temperatures for specific months between years were less pronounced. The first half of the year experienced higher temperatures than the second half, with February and March being the warmest and most variable months. October and November were the coldest, with November being the least

variable. The figure below provides a proper rainfall scenario in the past year as opposed to the table in 4.2.4 above.

Consistent with the information provided, there was substantial diversity in both the quantity and timing of rainfall between different years. This variation is evident when comparing the mean monthly values, as well as the ranges and standard deviations in monthly rainfall and temperatures across years. The years 1973 and 1983-84, characterized by El Niño events, stand out as not only wetter but also having the most significant inter-monthly extremes in rainfall (refer also to Ellis and Galvin 1994). In contrast, 1982 exhibited the least variation between months.

Therefore, the past information suggests that the unpredictable and extreme monthly and annual variations in rainfall at Kibale prevent the establishment of clearly defined seasonal biological events, such as breeding or fruiting seasons that might rely on consistent rainfall patterns. Apart from this temporal variability, there are climate distinctions within the KNP likely linked to changes in elevation. The rainfall and temperature details cover lower and higher elevations, for example, at 1530m and 1,350m respectively. The description is simplified in Figure 4-13 below:

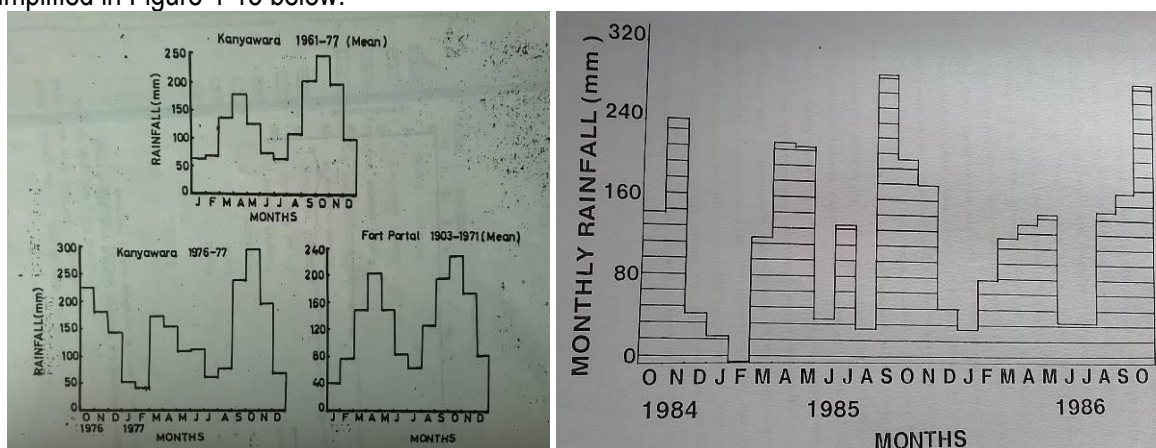


Figure 4-12: Rainfall variation adopted from: Struhsaker (1997)

4.3.6 Climate change

Climate change, in climatic terms, is an attribute directly or indirectly related to human activities that alter the composition of the global atmosphere, in addition to natural climate variability observed over comparable time periods. It is one of the most widely contemplated aspects of the global environment. Climate change is a consequence of the emission of greenhouse gases (GHGs) such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (NO).

In addition to the above, there are synthetic compounds such as hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, and nitrogen trifluoride. Climate change is an emerging and significant global environmental challenge, resulting in complex consequences and scenarios. The primary cause of climate change is the warming of the Earth, primarily induced by human activities, including land use practices and industrial development, which emit greenhouse gases (GHGs). These gases contribute to the thickening of the carbon dioxide layer, leading to rising temperatures. The assessment of climate change in a specific area

is typically based on a temporal scale of at least decades (Yanda et al, 2011). In terms of climate change, Uganda is expected to experience increased rainfall in the coming years due to its location on the Intertropical Convergence Zone (ITCZ) (NAPA 2007). The rainfall increment relates to the Kabarole District where the project is proposed. However, there are already adaptation plans and strategies that address any extreme that may occur in this regard. Road infrastructure from entry boarder points is well maintained, health and emergency response systems in place. Any likely vulnerability can be addressed to the national integrated management team at the Office of the Prime Minister (OPM). The OPM is charged with coordination of Sustainable Development Goals (SDGs) for which SDG 13 is highly considered by strategically developing and implementing adaptation and mitigation measures in Uganda.

Recognizing the inherent uncertainties associated with predicted impacts, it is essential to acknowledge the vulnerabilities of the canopy walk to climate change and explore potential adaptation strategies within the broader context of the Canopy Walk establishment. Typically, climatic changes are influenced by alterations in temperature and precipitation. Another factor, albeit less likely, is the occurrence of fires in the KNP forests but possible. These changes can impact the Canopy Walk in various ways, either during its construction or operational phases. Climate change may result in extremes such as flooding of the Mpanga River and droughts, which could compel wildlife to seek pasture and affect hunting activities. However, it is anticipated that these events may occur in the distant future. Despite the noted common cause in climatic change, the canopy walk construction is a designed in a NetZero establishment.

4.3.7 Canopy Walk NetZero

Louman and colleagues (2019) observed that the widespread adoption of mitigation activities would lead to advantageous outcomes for forests and the communities relying on them. These benefits include minimized reductions in forest area and biodiversity, and enhanced functions and services. Forest- and land-based climate initiatives possess the capability to facilitate societal adaptation to climate change and contribute substantially, accounting for up to 20% of the requisite emission reductions to achieve the 2°C goal.

There are growth sectors responsible for a significant portion of global greenhouse gas emissions, and it is much better for a developer or proponent projects to be net zero carbon by 2030 and all existing ones by 2050. This necessitates significant changes in the way we design, build, and operate programs and plans. Despite the potential advantage realization, a mere 3% of climate finance is currently allocated to support these endeavors. It is thus that NetZero initiatives are designed. The current term used to describe the equilibrium between the production and removal of greenhouse gases (GHGs) in the atmosphere is NetZero. Various innovative approaches are being developed to decrease the driving sources of carbon emissions, accomplished through a combination of emission reduction and atmospheric removal.

The proposed construction and operation of the canopy walk has been meticulously planned with a reductionist strategy aimed at achieving net-zero. In the construction phase, materials, starting with concrete, will be sourced externally, mixed outside the park, and transported to fill pits designed to support the steel suspended pillars. Additionally, no trees will be felled down or replaced with construction materials. Any

emissions associated with this project will occur outside the operational area. Nevertheless, the project implementation team or the client must explore sustainable approaches for achieving a net-zero canopy walk within Sebitoli, ensuring a future that includes comprehensive waste management and the reduction of emitting sources in the project area.

4.3.8 Air and noise quality measurements

The purpose of this assessment is to describe the potential effect of the construction and operation of the Canopy Walk Project on ambient air quality, and identify suitable mitigation and management measures to address potential impacts. The assessment of the potential impact of air emissions from the Canopy Walk activities has been conducted in accordance with the National Environment Air Quality Standards & IFC EHS guidelines on Air emissions and The National Environment (Air Quality Standards) Regulations 2024.

UWA's plan to construct a Canopy Walk in KNP has been recognized for its significant environmental impact due to the proposed construction activities. Throughout the construction and decommissioning phases, the regulation of air emissions is necessary, following common practices for projects of this nature. The air quality regulations focus on compliance with laws and standards, including the National Environment Air Quality Standards, International Finance Corporation (IFC), Environment, Health, & Safety (EHS) guidelines on Air Emissions, and the National Environment (Air Quality Standards) Regulations 2024.

In compliance with national standards, government formulated preliminary air quality standards for emissions from diverse sources, necessitating public input prior to their enactment into law. These standards are applicable to both ambient air and point source emissions, including those from power generators and motor vehicles. The specific standards are outlined in Table 4-15. In instances where the National standards are unavailable, the IFC/WHO standards, as listed in Table 4-16, will be considered sufficient.

Table 4-15: National Air Quality Standards

Pollutant	Averaging Period	Standard for Ambient Air
Carbon monoxide (CO)	24-hr.	7 mg/ m ³
	8 -hr.	10 mg/m ³
	1-hr	35 mg/m ³
Hydrogen Sulphide (H ₂ S)	1-hr.	42 µg/m ³
Ozone (O ₃)	1-hr.	235 µg/m ³
	8-hr.	120 µg/m ³
Nitrogen dioxides (NO ₂)	Annual average	30 µg/m ³
	24-hr	50 µg/m ³
Sulphur dioxide (SO ₂)	1-hr	50 µg/m ³
	24-hr.	20 µg/m ³
Total Volatile Organic Compounds (VOCs)	24 hr.	600 µg/m ³
PM _{2.5}	Annual Average	25 µg/m ³



Pollutant	Averaging Period	Standard for Ambient Air
PM ₁₀	24-hr.	35 µg/m ³
	Annual Average	40 µg/m ³
	24-hr.	60 µg/m ³

Furthermore, the following values are proposed for point source emissions from combustion processes: (i) Nitrogen Oxides (NO_x) – 300mg/Nm³ (ii) Sulphur dioxide – 400mg/Nm³ (ii) total suspended particles/particulate emissions – 50mg/Nm³.

International Standards

These Guidelines include relevant values taken from the World Health Organization (WHO) Air Quality guidelines for the assessment of air quality impacts associated with the project. These are summarized in Table 4-16 below:

Table 4-16: WHO Air Quality Guidelines

Pollutant	Averaging Period	WHO Guideline Value (µg/m ³ unless stated)
Sulphur dioxide (SO ₂)	10 min	500
	1 hr.	-
	24 hr.	50
Nitrogen dioxide (NO ₂)	1 hr.	200
	Annual	40
Particulate matter (PM 10)	24 hr.	50
	Annual	20
Particulate matter (PM 2.5)	24 hr.	25
	Annual	10
Carbon monoxide (CO)	Maximum daily 8 hour running average	n/a

The permissible noise levels for construction, as determined by regulatory guidelines, establish the maximum allowable limits for noise emissions in the surrounding environment during construction activities. Table 4-17 and Table 4-18 below shows acceptable levels respectively.

Table 4-17: Maximum Permissible noise levels for construction (on surrounding environment)

Facility	Maximum noise level permitted Leq in dB (A) Day	Maximum noise level permitted (Leq) in dB (A) Night
Hospitals, schools, institutions of higher learning, homes for disabled, etc.	50	60
Buildings other than those prescribed above	75	65

Table 4-18: Maximum permissible noise levels for construction (on workers)

	108

Activity	Maximum Noise Level permitted (Leq) in dB(A)
Work requiring a large amount of concentration	55
Work requiring verbal communication or great accuracy and attention	85
Any noise setting	85

The approaches applied to assess the air quality are described in the Table 4-20 below.

Equipment

Table 4-19 lists equipment that were used for air quality and noise assessment.

Table 4-19: Field equipment used for the air quality and noise assessment

Equipment	Purpose
 GPS	Taking GPS coordinates for all locations where air quality samples were obtained
 MultiRAE meter	Measures air composition; O ₂ , VOC, and CO
Casella Microdust Pro	Particulate matter assessment was done with the help of Casella Cell 712. It measures particulate matter of a range from PM _{2.5-10} .

Equipment	Purpose
 iBRID MX6	Measures air composition; NO_x, SO_x,
 Noise Metre	For Measuring Noise levels

A MX6 iBrid multi-gas meter was used to measure ambient air at selected areas in reference to potential sources and receptors within the proposed canopy walkway project area. Particulate matter assessment was done using a Casella cell 712. The infield air quality assessment procedure is described as follows:

For gaseous emissions:

- 1) The equipment was powered on and left in measuring mode for the first two minutes to allow zeroing. This was followed by short term infield measurements to allow digital readings to stabilize before they could be recorded.

- 2) Measurements were conducted at each of the selected points to determine whether there would be any gaseous emissions detected.
- 3) Values for VOC, CH₄, SO₂, NO and NO₂ are then noted.

For particulate matter (PM_{2.5} & PM₁₀)

- 1) The equipment was allowed for two minutes for zeroing down and there after left to capture results of PM_{2.5} & PM₁₀ at selected points to be assessed.

The noise investigations that have been conducted to quantify baseline ambient noise levels and describe the acoustic; environmental values in the project area; sample noise emissions from Canopy Walk infrastructure construction, operation and decommissioning of proposed project; assess the impact of Canopy Walk infrastructure; Uganda's noise Regulations and Guidelines, and assess the cumulative noise impacts of Canopy Walk infrastructure; considering noise emissions from existing and approved; the critical noise issues in relation to project approvals relate to: noise impacts associated with the construction of Canopy-in-KNP; noise impacts of operational CW-in-KNP.

The assessment applied measurement on weighting scale A (hence dBA units) using a CEM DT-8852 Data logging Sound Level Meter at selected locations within the proposed Canopy walkway project area.

The approach of the assessment was considered with unique characteristics of the project's location, it was essential to expand the standard impact significance matrix to accommodate an additional category for assessing receptor sensitivity. The evaluation of the project's impacts on the physical environment, including air and noise, involved assessing the sensitivity of receptors in conjunction with the magnitude of the impact:

Duration of the measurements

- Noise values were recorded at selected points for a period of 30 minutes at each selected point.
- "Free field" noise measurements i.e., levels where influence of reflections is minimized were made and measurement carried out at least 1.5 metres from any reflecting structure other than the ground.
- A weighted sound level exceeded for N% of a given measurement period was denoted LN of that level.

Instrumentation was field calibrated prior to and following measurements with all post-calibration results within acceptable ranges of dBA.

Baseline status of air quality

The quality of the air over the CW-in-KNP is good, given that the area is predominantly covered with native forest. UWA will manage air emissions generation associated with all activities through the construction, operation and decommissioning of canopy walk infrastructure and compliance with environmental management plans. This will entail application of UWA's best practice air emission reduction, as appropriate to meet the air quality objectives set in the Regulations.

The tea plantations, Fort Portal – Kampala road, and distant tea factories constitute the primary contributors to air pollution in the region. Additionally, small trading centres and Fort Portal City and plus agricultural activities generate dust. Despite the construction, operation, and decommissioning processes expected to have negligible impacts on the Canopy Walk in the KNP, the significant distances and geographical locations of these factors are likely to mitigate their effects.

Air quality values were recorded at selected points along, around, and within the project proposed area. The table provides information on air quality parameters at various locations as part of the baseline assessment. The locations of the spotted sections are included with their GPS coordinates, and the air quality parameters include SO₂, NO₂, NO, Oxy (%), CO, VOC, PM_{2.5}, and PM₁₀. Additionally, the table includes ambient air quality standards from NEMA and WHO/IFC for comparative baseline data analysis that determined current status as related to the assessment. The captured information is the basis for determinants for in case of project consequences of project planned actions. Following the standards that have been correlated with have given in order to avoid any likely deterioration in Table 4-20 below:

Table 4-20: Air Quality levels recorded at the selected points of assessment

	Coordinates (WGS 84, UTM 36N)	SO₂ pp m	NO₂ Pp m	NO pp m	Oxy %	CO pp m	VO C pp m	PM 2.5µg/m³	PM1 0 µg/m³
NEMA Draft Ambient Air Standards		0.5	0.2	0.2	19.5- 23.5	9.0	6	40	60
WHO/IFC Air Quality Standards		0.5	0.2	0.2	19- 23.5%	60		25	50
Canopy walkway trail point 1	36N 209064 71137	0	0	0	21.1	0	1.3	0	0
Canopy walkway trail point 2	36N 208995 71089	0	0	0	21.1	0	0	1	4
Elephant Trail-1	36N 208968 71101	0	0	0	20.9	0	1	0	0
Elephant Trail-2	36N 208898 71113	0	0	0	20.9	0	0	0	0
Elephant Trail-3	36N 208867 71129	0	0	0	20.9	0	1	0	0
UWA camp	36N 208946 71301	0	0	0	21.1	0	0	0	0
UWA Research Camp	36N 208965 71585	0	0	0	21.1	0	1	11	18

Values for parameters sampled were found within the permissible IFC Air Quality Guidelines (2007), WHO Air Quality Guidelines (AQG), 2005 and National air quality standards. This was attributed to the natural state of the project as its undisturbed within less human activity.

There will be less or no emissions generated during construction, operation, and possibly even in decommissioning activities that may release pollutants into the project area. However, emissions are

expected during the operation of equipment and machinery vehicles, which could affect ambient air quality outside the project site. The baseline ambient air quality, as presented in Table 4-21 above, indicates that the larger part of the proposed project area is a pristine ecosystem that will be used for tourism and recreational activities, characterized by good air quality. The gaseous emissions from project equipment are anticipated to include CO₂, NO₂, SO₂, and hydrocarbons, including volatile organic compounds, as most construction equipment and machinery will be powered by either petrol or diesel engines.

For the assessment of air quality, the sensitivity criteria have been applied. Additionally, the table also outlines the magnitude criteria, considering factors such as the nature of equipment that might generate gaseous emissions, impact extent, and duration. In determining impact magnitude, both impact scale and frequency have been considered. The standards considered for assessing potential impacts on air quality are covered in legal framework. Air quality impacts have been both quantitatively and qualitatively assessed using professional judgment and drawing on past experiences from related projects.

Baseline status of noise levels

Noise is expected to result from project activities, posing minimal aerosols to the general environment, including UWA staff, tourists, research students, and wildlife within the vicinity of the project site. Relevant baseline information is provided in Table 4-21. According to this data, the average noise levels at selected sensitive receptors were found to be within the noise threshold standard of 45 dB, as specified for buildings used as hospitals, convalescence homes, homes for the aged, sanatoriums, institutes of higher learning, conference rooms, public libraries, environmental or recreational areas. This standard is outlined in the National Environment (Noise Standards and Control) Regulations, 2003. The primary noise sources in and around the project area of influence include motor vehicles and audible sounds from biodiversity like primates, insects and birds.

Table 4-21: Noise levels recorded at the selected points of assessment.

Location	GPS Coordinate s	National Standard	Sound Pressure Level dBA		Source of Noise	Background Noise
			LAMax	LAeq		
Canopy walkway trail point 1	36N 209064 71137	45	54.6	39.6	Insects, birds chirping	Traffic along Fort portal- Kampala road
Canopy walkway trail point 2	36N 208995 71089	45	76.5	31.5	Insects, birds chirping	Traffic along Fort portal- Kampala road
Elephant Trail-1	36N 208968 71101	45	83.4	30.8	Insects, birds chirping	Traffic along Fort portal- Kampala road
Elephant Trail-2	36N 208898 71113	45	40.3	31.2	Insects, birds chirping	Traffic along Fort portal- Kampala road



Elephant Trail-3	36N 208867 71129	45	40.3	37.9	Insects, birds chirping	Traffic along Fort portal- Kampala road
UWA camp	36N 208946 71301	45	53	41.3	Human conversation s	Traffic along Fort portal- Kampala road
UWA Research Camp	36N 208965 71585	45	58	43.7	Human conversation s	Traffic along Fort portal- Kampala road

From the noise assessment data recorded in Table 4-21 above, there were no exceedances of the values recorded of the permissible levels as per the National Environment (Noise Standards and Control) Regulations 2003.

4.3.9 Water

Surface water

The only study component undertaken during this assessment is the examination of surface water and watercourses used by the Sebitoli communities. The primary goal of the study was to investigate ways to minimize negative environmental effects and maximize environmental benefits linked to the Canopy Walk project. This involves the preservation, protection, and improvement of biodiversity values and water resources in the project's operational zones wherever feasible. Subsequently, the study aimed to identify, evaluate, manage, monitor, and review risks to the Uganda Wildlife Authority's (UWA) workforce, property, the environment, and the communities affected by its activities. Notably, for the establishment and operation of the canopy walk, the project area has limited or no reliance on water resources, simplifying the overall strategy.

The drainage of the area is primarily facilitated by the R. Mpanga and the Sebitoli stream. The stream is a seasonal watercourse that collects surface runoff from the marshy regions near the forest. Its stream bed is densely covered with shrubs and saprophytic vegetation. Approximately 10 meters upstream of the Tourist-Track Bridge used for forest walks, the Sebitoli stream joins the R. Mpanga. Originating from the foothills of Mount Rwenzori, the River traverses the Sebitoli Tourism Zone at an elevation of around 1150m asl.

Additional water sources in the area include the Sebitoli Swamp, which drains the steep slopes of farmlands and tea estates. The streams in these swamps are seasonal and eventually merge into the R. Mpanga. Notably, the R. Mpanga serves as a crucial source of domestic piped water for the Fort Portal National Water and Sewerage Corporation (NWSC) Water Works. This water supply system caters to urban centers, including Fort Portal City, Kamwenge, and Ibanda Towns. The piped water at the base camp of the Sebitoli Tourism Zone is sourced from the same NWSC distribution grid. To meet its domestic water needs, the UWA Base camp at the Sebitoli Tourism Zone employs rainwater harvesting during rainfall events, without subjecting the collected rainwater to any residual treatment.

Baseline Water Quality characteristics

Samples from surface, ground, and potable water sources within the project area were collected to establish the baseline water quality characteristics in the Sebitoli Tourism Zone. Table H1 outlines the specifics for each visited sampling site, where onsite measurements encompassed physical-chemical parameters like temperature, oxygen concentration and saturation, electrical conductivity, pH, and turbidity. These measurements were conducted using a calibrated Eureka Manta 35TM probe.

For chemical analysis, a one-liter water sample was obtained from each sampling site and sent to the National Water Quality Reference Laboratory (NWQRL). The NWQRL conducted a comprehensive analysis, including nutrients (Ammonium $\text{NH}_4\text{-N}$, Nitrates $\text{NO}_3\text{-N}$, Nitrites $\text{NO}_2\text{-N}$, Total Nitrogen, Phosphates), metal contaminants, and the general physical characteristics of the water resource.

It's important to note that the quantity and quality of water reaching the water sources in the Sebitoli Tourism Zone can vary over time due to various natural and anthropogenic factors. These influencing factors, affecting water quality and quantity within the tourism zone, have repercussions on their capacity to support ecosystem services in the area. These services range from providing safe drinking water to the community, enhancing the aesthetic appeal of rivers and streams, and regulating the microclimate, among other functions.

Therefore, the water assessment aimed to identifying and listing water resources in the area, including streams, rivers, and significant developed groundwater resources; establish baseline water quality data for these resources before project implementation; and conduct an impact assessment on area water resources, implementing mitigation measures to safeguard against pollution and other identified impacts.

River Mpanga

The River Mpanga, the primary surface water resource in the project area, lies approximately 500m uphill from the proposed development. This river holds significant socio-economic importance as it supplies water for various purposes, including meeting the domestic water needs of downstream towns. The River Mpanga is integral to the Lake George catchment area where it ultimately drains. Presently, upstream activities such as a densely populated settlement and insufficient waste management in Fort Portal City have adversely affected the water quality of this resource. Consequently, any additional sediment loads and pollutants introduced during project execution are likely to result in irreversible ecological damage. Table 4-22 presents water sampling sites within the project area.

Table 4-22: Site descriptions and locations of the select sites assessed for baseline water quality characteristics of the proposed Canopy Walk in Sebitoli Tourism Zone

Sample No.	Site Name	Zone	GPS Location	Site Description
1.	Mpanga River along at F. Portal – Kampala Highway	36N	E. 209898 N. 71188 Alt. 1421	Mpanga River – Downstream proposed Canopy walk area.



Sample No.	Site Name	Zone	GPS Location	Site Description
2.	NWSC Yard Tap at Sebitoli Base Camp - UWA	36N	E. 208947 N. 71286 Alt. 1511	Drinking water source within the Sebitoli Tourism Zone area where project is proposed.
3.	Rainwater harvesting tank at Sebitoli Base Camp – UWA	36N	E. 208947 N. 71286 Alt. 1511	Alternative drinking water source within the Sebitoli Tourism Zone area where project is proposed.
4.	Open well at Sebitoli farmlands	36N	E. 208290 N. 71520 Alt. 1445	Site for determining water quality of the ground water aquifers within the proposed Canopy Walk area.
5.	Shallow well at Sebitoli farmlands	36N	E. 207933 N. 71520 Alt. 1449	Alternate site for determining water quality of the ground water aquifers within the proposed Canopy Walk area.
6.	Mpanga River at Sebitoli village	36N	E. 207652 N. 73061 Alt. 1447	Mpanga River – Upstream proposed Canopy walk area.
7.	Sebitoli stream at Mpanga River confluence	36N	E. N. Alt.	Stream directly draining water from the slopes of the proposed Canopy walk area into Mpanga River.

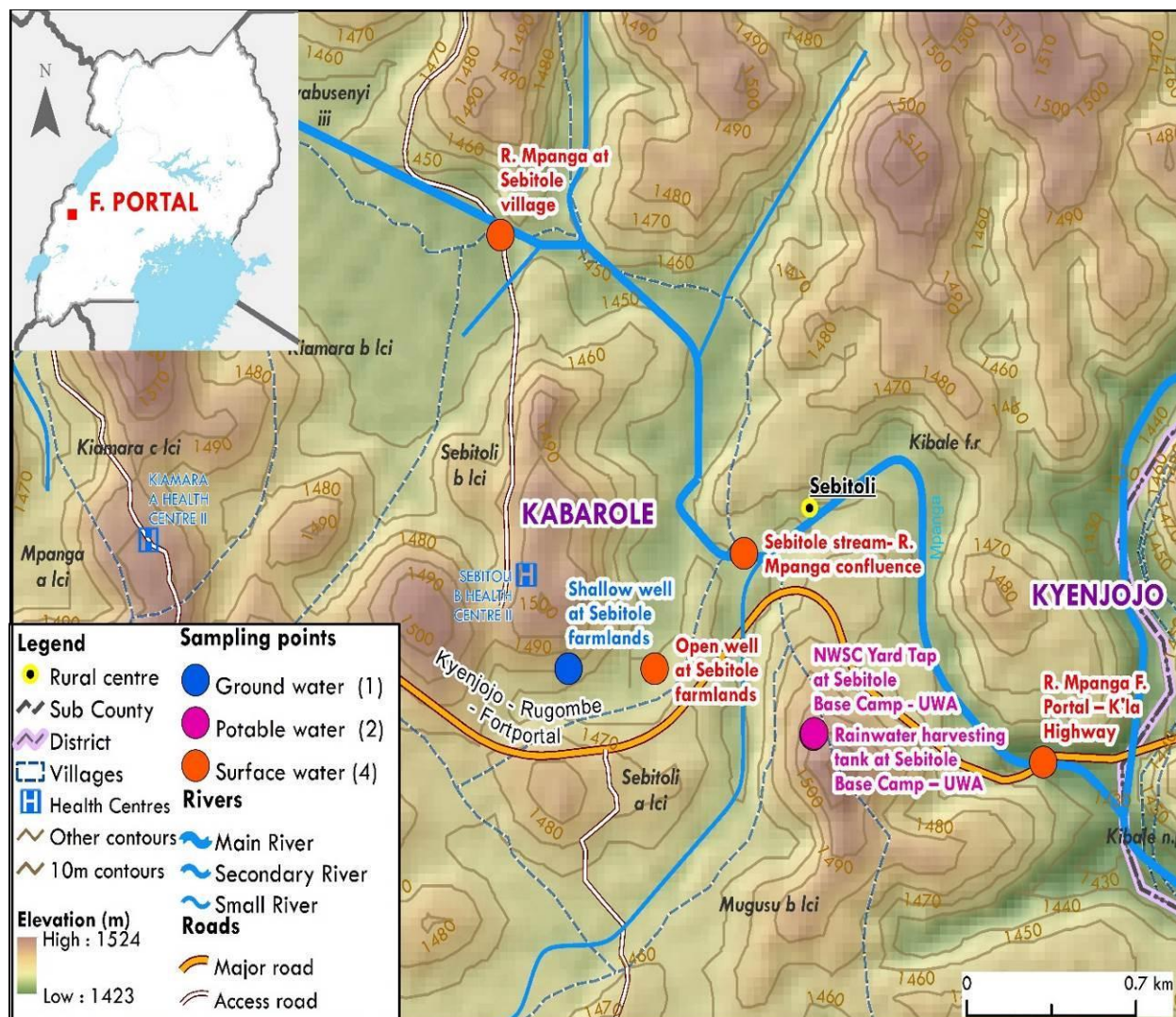


Figure 4-13: Area Topography, runoff and the discharge points into Sebitoli stream

The Figure 4-14 the area topography, it shows that runoff from the site is discharged into Sebitoli stream that empties into R. Mpanga at Sebitoli as in Figure 4-14 below:

Wetlands and associated streams

Sebitoli stream in the project area directly draining water from the slopes of the proposed Canopy walk area into R. Mpanga. Other than the stream, the proposed site is not in a wetland and no wetlands are within a 500m radius of the proposed project site.

Ground water resources

Groundwater development in the project area is mainly used for meeting domestic water needs using hand pumps/boreholes. A shallow well was found in the lower areas of the project area at Sebitoli farm that is used

by the community. Ground water quality in the project area as presented in the laboratory analytical results was generally of acceptable quality and less impacted by pollution.

Potable/Domestic piped water system

Domestic water demands in the project area are mainly met by a mix of technologies. From piped water supply by National Water and Sewerage Cooperation (NWSC) with an abstraction from River Mpanga to rainwater harvesting and ground water abstraction. Figure 4-14 shows the different water points where sampling was done.

Pictorial impression showing stream beds.



Figure 4-14: Pictures taken during sampling

Water quality findings

The findings are listed below:

1. The area where construction and installation works will be undertaken for the Canopy Walk site is at a higher elevation compared to all surface water sources flowing within the area and therefore no direct interaction with the natural water resources of the area. Furthermore, there was no evidence of interception of the ground water table within the area of construction activities in form of springs or artesian wells.
2. The direct water resource draining the construction area is the seasonal Sebitoli stream which drains surface runoff from the slopes of the construction area. Since it flows through the park, its stream bed has a dense vegetation which improves water quality through intercepting excess nutrients and materials dissolved or suspended through its flowing water. The stream has a significantly low conductivity compared to the Mpanga River which suggest minimal disturbance of the area it drains.
3. Subsistence farming and tea growing are undertaken up to the riverbanks of the Mpanga River. Such activities may potentially lower the quality of water through increased erosion and leaching of farm implements like fertilizers and therefore the need to carry out water source protection activities for R. Mpanga within the area.
4. Development of the Canopy Walk could divert the course of animal tracks (especially elephants and Chimpanzees) within the park towards the water resources which may increase the transfer of nutrients and materials into the water resources as they wade along the streams.
5. There was no form of treatment of the rainwater harvested at the UWA Base camp facilities which limits the use of this water to domestic water uses other than drinking. The drinking water sources within Sebitoli village are not fenced and therefore prone to contamination from animals. Construction of a protected spring should be planned and implemented at the open spring at Sebitoli village as an extra measure of water source protection.
6. The conductivity of R. Mpanga significantly reduced from 521 $\mu\text{Sm}/\text{cm}$ at Sebitoli village to 498 $\mu\text{Sm}/\text{cm}$ along the Kampala – Fort Portal Highway owing to the protected area of Game Park.
7. The drinking water sources (Tap at UWA, Shallow well at Sebitoli Village and rainwater harvesting facility) were within the East African standards for potable water for the parameters analyzed.
8. Total suspended solids (TSS) in the surface water were found to be within baseline characteristics of other surface waters in the Albertine region, owing to surface flows within naturally preserved forest landscapes.

Tables 4-23 and 4-24 summarise the quality assessment results for the sample down at the GPS coordinate indicated in the last column on the right-hand side.

Table 4-23: Surface water quality in the project area

	119

Source Name		Mpanga River along at F. Portal – Kampala Highway	Mpanga River at Sebitole village	Sebitole stream at Mpanga River confluence
District		Kabarole	Kabarole	Kabarole
GPS (Easting & Northing)		36N 209898 71188	36N 207652 73061	36N 208660 71930
Parameter	Units	Test Results	Test Results	Test Results
Temperature	oC	19.8	21.2	17.0
Dissolved Oxygen	mg/l	6.3	7.1	6.5
Color	PTCO	250.0	231.0	200.0
Turbidity	NTU	17.6	31.8	27.4
pH	pH units	8.2	8.2	7.8
Electrical Conductivity	µS/cm	498	521	172
Total dissolved solids	mg/l	349	365	120
Total Hardness	mg/l	200.0	208.0	N/R
Calcium Hardness	mg/l	130.0	130.0	N/R
Magnesium Hardness	mg/l	80.0	78.0	N/R
Calcium	mg/l	55.0	52.0	N/R
Magnesium	mg/l	19.0	18.7	N/R
Total Alkalinity	mg/l	255	220	260
Bicarbonates	mg/l	179	154	182
Sulphates	mg/l	6.3	5.4	2.0
Chlorides	mg/l	7.6	6.4	4.0
Nitrates as N	mg/l	1.47	0.31	0.24
Nitrites as N	mg/l	0.010	0.010	0.010
Ammonium as N	mg/l	0.42	0.11	0.22
Phosphates as P	mg/l	0.08	0.16	0.17
Total Phosphorus	mg/l	0.09	0.18	0.19
Total Nitrogen	mg/l	2.29	0.52	0.56
Sodium	mg/l	16	16	4
Potassium	mg/l	3.8	3.5	1.2
Total Iron	mg/l	1.9	1.8	0.8
Chemical Oxygen Demand	mg/l	6	8	9
Nickel	mg/l	<0.005	<0.005	<0.005
Copper	mg/l	<0.002	<0.002	<0.002
Zinc	mg/l	0.02	0.03	0.007
Lead	mg/l	<0.015	<0.015	<0.015
Total suspended solids	mg/l	18	32	6

Table 4-24: Potable and ground water characteristics in the project area

Source Name		NWSC Yard Tap at Sebitole Base Camp - UWA	Rainwater harvesting tank at Sebitole Base Camp – UWA	Open well at Sebitole farmlands	Shallow well at Sebitole farmlands
District		Kabarole	Kabarole	Kabarole	Kabarole
GPS (Easting & Northing)		36N 208947 71286	36N 208947 71286	36N 208290 71520	36N 207933 71520
Parameter	Units	Test Results	Test Results	Test Results	Test Results
Temperature	oC	20.2	20.8	20.6	20.7
Dissolved Oxygen	mg/l	4.3	3.4	3.1	4.9
Color	PTCO	175	186	12	24
Turbidity	NTU	18.8	6.0	1.8	2.3
pH	pH units	8.4	7.1	5.7	5.6
Electrical Conductivity	µS/cm	397	18	54	56
Total dissolved solids	mg/l	278	12	38	39
Total Hardness	mg/l	190	5.0	20	16
Calcium Hardness	mg/l	130	3.0	6.8	6.2
Magnesium Hardness	mg/l	60	2	13	10
Calcium	mg/l	52	1.2	2.7	2.5
Magnesium	mg/l	14	0.5	3.2	2.4
Total Alkalinity	mg/l	210	6.0	16	17
Bicarbonates	mg/l	147	4	11	12
Sulphates	mg/l	6.1	0.2	3.4	1.1
Chlorides	mg/l	5.2	40	1.4	3.9
Nitrates as N	mg/l	0.40	1.45	2.50	1.52
Nitrites as N	mg/l	0.010	<0.002	<0.002	<0.002
Ammonium as N	mg/l	0.12	0.20	0.18	0.20
Phosphates as P	mg/l	0.06	0.05	0.20	0.04
Total Phosphorus	mg/l	0.07	0.06	0.23	0.04
Total Nitrogen	mg/l	0.63	1.98	3.22	2.07
Sodium	mg/l	10	<0.5	2	3
Potassium	mg/l	2.8	0.4	0.2	0.8
Total Iron	mg/l	1.5	0.4	0.1	0.2
Chemical Oxygen Demand	mg/l	<5	<5	<5	<5
Nickel	mg/l	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	<0.002	<0.002	<0.002	<0.002
Zinc	mg/l	<0.002	<0.002	0.01	0.01
Lead	mg/l	<0.015	<0.015	<0.015	<0.015
Total suspended solids	mg/l	<0.5	1	5	<0.5

4.3.10 Archaeology and Cultural Heritage

In the past, Sebitoli has been positioned in a region possessing a diverse cultural heritage, notwithstanding its location within a protected area. The ESIA considered the historical areas described in this ESIS. It is important to note that these are located outside the KNP but contribute to the regional touristic trail. Conducted were focused field surveys to distribute test sites and investigate areas of sensitivity where infrastructure development might take place. These locations revealed clusters of sites with selected areas containing stone artifacts.

Archaeological and cultural heritage value assessment

The field survey took place in January 2024, covering the entire site of 450m long python like walk with particular attention given to the area initially designated as sawmill. Cultural heritage assessments for the Canopy Walk development area were conducted following the approved NEMA Terms of Reference. Assessing and minimizing the potential impacts of the proposed Canopy Walk development to KNP heritage values was considered. The study was the collation of site information from the following sources:

Survey

According to Fagan & DeCorse (2005), such survey entails a systematic and unsystematic effort to locate, identify, and document the distribution of archaeological sites on the ground. Systematic survey methods include the use of a grid system or a series of evenly spaced transverses or transects, walked in a systematic manner (Renfrew & Bahn, 2008). On the contrary, unsystematic survey involves traversing each part of the area, such as ploughed fields or Canopy Walkways, scanning the ground along one's path, and collecting or examining surface artifacts while recording their locations, along with any associated surface features (Feder, 1997; Renfrew & Bahn, 1996).

In this assessment, an unsystematic survey approach was predominantly utilized due to the dense and vegetated characteristics of the project area, marked by thick vegetation and depressions that impeded clear visibility and accessibility. Consequently, field personnel conducted sporadic spot checks throughout the study area and directed surveys based on information obtained from local guides and leaders. The data collection methodology encompassed observations, recording, photography, and documentation of all identified cultural sites, artifacts, and other environmental features susceptible to the project's impact.

Test Pit Excavations

Excavation involves the systematic uncovering of archaeological remains through the removal of deposits (Renfrew & Bahn, 1996). As explained by Fagan, & DeCorse (2005), there are general methods for excavation, but the suitable ones vary depending on the site and evolve throughout the excavation process. It is characterized as a negotiated process, balancing the acquisition of maximum information with the potential for destruction. Excavation continues to play a central role in fieldwork because it provides the most reliable evidence for the two primary types of information that archaeologists seek. The first pertains to human activity during a specific historical period, while the second involves establishing chronology. This distinction between horizontal "slices of time" and vertical sequences through time serves as the foundation for most excavation activities (Renfrew & Bahn, 1996). In the context of this project, establishing excavation units or test pits in the project area proved practically challenging due to the project's location within the park. This precautionary measure was taken to prevent disruption to wildlife and the geological setting of the area. Nonetheless, the data obtained from the archaeological survey proved to be sufficiently representative.

Desktop survey

To gain a comprehensive understanding of the project, a literature review was conducted, encompassing both the project itself and analogous developments in the country. The primary emphasis was on archaeology, palaeontology, and the socio-cultural aspects of the broader project area. Special attention was

given to exploring studies on the culture of the people in Kabarole and its surroundings, as they will directly experience the project's impact. Some of the reviewed literature suggests that Kabarole district boasts a rich cultural heritage. However, there are no formally recorded archaeological or cultural heritage sites within the specific project area. The evaluation and confirmation of the heritage potential of the project area was undertaken.

Consultation and Community Engagement Meetings

Opinions of pertinent stakeholders at both national and local levels to gather insights on the project and the cultural resources within the project area were sought. Primary consultees included the Department of Museums and Monuments in the Ministry of Tourism, Wildlife, and Antiquities, local leaders from Kabarole District Local Government, and the residents of the project area.

The local assistants were hired to serve as guides during the archaeological survey in the project area. Community involvement was primarily driven by their intimate knowledge of the project area and their comprehensive understanding of the physical cultural resources within and around their homes.

Figure 4-15 shows the project study area where an orange python-like ring is overlaid and the blue line is the movement of survey team within Sebitoli zone of KNP.



Figure 4-15: Location of Archaeological and Cultural Heritage Sites in the Proposed Project Area

Archeological findings

○ Consultative Meetings with Key Stakeholders

Engaging with key stakeholders in archaeological institutions, such as the Department of Museums and Monuments, Kabarole District Local Government, UWA Field Office, and the local community around the proposed project area, provided the information presented in the Table 4-25 below.

Table 4-25: Results of the Consultative Meetings with Stakeholders

Institution	Issues Raised	Response
Ministry of Tourism, Wildlife and Antiquities		
Department of Museums and Monuments (Research, Sites and Monuments and Natural History)	- Conduct archaeological survey in the proposed project area and document any archaeological and heritage resources that may be affected. - Since the proposed project area is a national park, it is quite sensitive to conduct any archaeological excavation or ground disturbing tests. The study team should rely more on archaeological survey and consultations.	- Archaeological survey was conducted throughout the wider project area and the results of the survey explained in the table of results 4.27 below. - No any archaeological test pits or excavation trenches were conducted in the project area. Instead, extensive archaeological survey beyond the project boundary was conducted.
Kabarole District Local Government	The study team should ascertain the heritage potential of the project area much as it is located within a gazetted area.	The proposed project is located within a gazetted national park. There will be no need to displace the community around the project area. The project instead, should involve the community to preserve some of the sites recorded for sustainability.
Uganda Wildlife Authority (UWA) Field Station	Informed the study team on the existence of remains of past human activities in the proposed project area, specifically the former Saw Mill site. The team was asked to survey the area and ascertain the heritage significance of the remains.	Archaeological survey was conducted in and around the former Saw Mill areas and the results of the survey is in the table of results Table 4.27 below.
Community around the Project Area	The community around the project area did not have specific concern on the project, however, they asked the team to document any cultural heritage in the proposed project area that may boost archaeo-tourism/cultural tourism potential of the area.	The proposed project should advocate for the preservation of traditional papyrus swamps especially those that are still used by the local community.

A limited number of searches are enumerated in Table 4-26 below, based on the discoveries made along the 450-meter-long study area walk.

Table 4-26: Findings of the Archaeological Survey in the Proposed Canopy Walk Project Area

Kabarole District			
Sebitoli Area			
Site Code	Site Name	Sebitoli Pottery Site 1 (SPS1)	
001	GPS Coordinates	36N 0208959 UTM 0071477, elevation 1492m	 <i>Plate 1: Potsherds at Scatters at SPS1</i>
	Baseline Condition and Significance	Scatters of pottery were recorded inside the project area. They were both decorated and undecorated pottery recorded close to the former Saw Mill. The decorations were in Plaited Grass Roulette (PGR) which dates to the Late Iron Age period. The pottery predates the Saw Mill period and the means the area was settled before the Saw Mill was established and subsequently the current usage of the park. This is a very important historical testimony that could add great value to the Canopy Walk project (Plate 1).	
002	Site Name	Sebitoli Pottery Site 2 (SPS2)	 <i>Plate 2: Potshred at Site SPS2</i>
	GPS Coordinates	36N 0209079 UTM 0070930, Elevation 1459m.	
003	Baseline Condition and Significance	Like SPS1 explained above, SPS2 was also recorded within the within the project area. It is characterized by scatters of both decorated and undecorated pottery, exposed on the Uganda Wildlife Authority Walkway. Analysis of the pottery indicates that they are of Late Iron Age settlers who settled in the park before it was gazetted. The site can help in the reconstruction of the history of the project area and probably adds value to its tourism potential. The proposed project may affect the site directly (Plate 2).	
	Site Name	Sebitoli Iron Working Site 1 (SIWS1)	
	GPS Coordinates	36N 0208960 UTM 0071483, Elevation 1493m.	

	Baseline Condition & Significance	In this side, a piece of iron implement was recorded close to the former Saw Mill area. Archaeological survey around the site to find associated ironworking evidence such as iron slag, tuyere and furnace proved futile. At the end, analysis of the iron implement showed that the object was part of the Saw Mill equipment that was abandoned by the project. This however contributes to the history of the past human utilization of the park (Plate 3).	
004	Site Name	Sebitoli Old Saw Mill Site 1 (SOSMS1)	
	GPS Coordinates	36N 0208948 UTM 0071493, Elevation 1498m.	
	Baseline Condition & Significance	Consultation with the guides indicates that there was a Saw Mill established in this area in the 1980s and 1990s. Archaeological survey identified a number of artefactual remains from the former Saw Mill such as iron implements, stones and bricks used in the construction of the Saw Mill. This site is of historical importance as it provides evidence to the human continued usage of the park (Plate 4).	
005	Site Name	Sebitoli Underground Ditch Site 1 (SUDS1)	
	GPS Coordinates	36N 0208948 UTM 0071493, Elevation 1498m.	
	Baseline Condition & Significance	This is located within the former Saw Mill area. The site has a deep ditch that could have been constructed as a deep well for water or an underground tunnel. Since archaeological excavation was not encouraged in the project area, it was difficult to establish the actual function of the ditch that seems was regularly constructed. Further study is needed to establish the actual function of the ditch (Plate 5).	
006	Site Name	Sebitoli Traditional Clay Source Site 1 (STCSS1)	
	GPS Coordinates	36N 0208761 UTM 00070947, Elevation 1459m.	
	Baseline Condition & Significance	The site is located more than 300m outside the project area. It is a water source with clay soils where community used to source for clay for making pots. Currently the water	

		source has drained off with small amount of water still being utilised by elephants. The project will not affect the water source directly but the site can aid in the reconstruction of the past human activities in the area (Plate 6).	
			<i>Plate 6: Water Source at STCSS1</i>
007	Site Name	Sebitoli Medicinal Plant Site 1 (SMPS1)	
	GPS Coordinates	36N 0208931 UTM 0071460, elevation 1471m	
	Baseline Condition & Significance	This was recorded inside the project area. Consultation with the community indicates that the bark of this plant which belongs to the ficus species are used for medicinal purposes by both humans and elephants. The project might affect some of the trees directly (Plate 7).	
			<i>Plate 7: Medicinal Plant at SMPS1</i>

4.3.11 Seismicity

According to the Seismic Code of Practice for Structural designs; Uganda National Bureau of Standards (UNBS), 1st Edition: June 2003, Kabarole District where the proposed project is to be located falls within zone 1 of the seismic zoning for Uganda as shown Figure 4-16 This implies that there is a high risk of earthquake occurrence within the project area and thus the project components have been designed and should be developed to withstand this kind of risk.

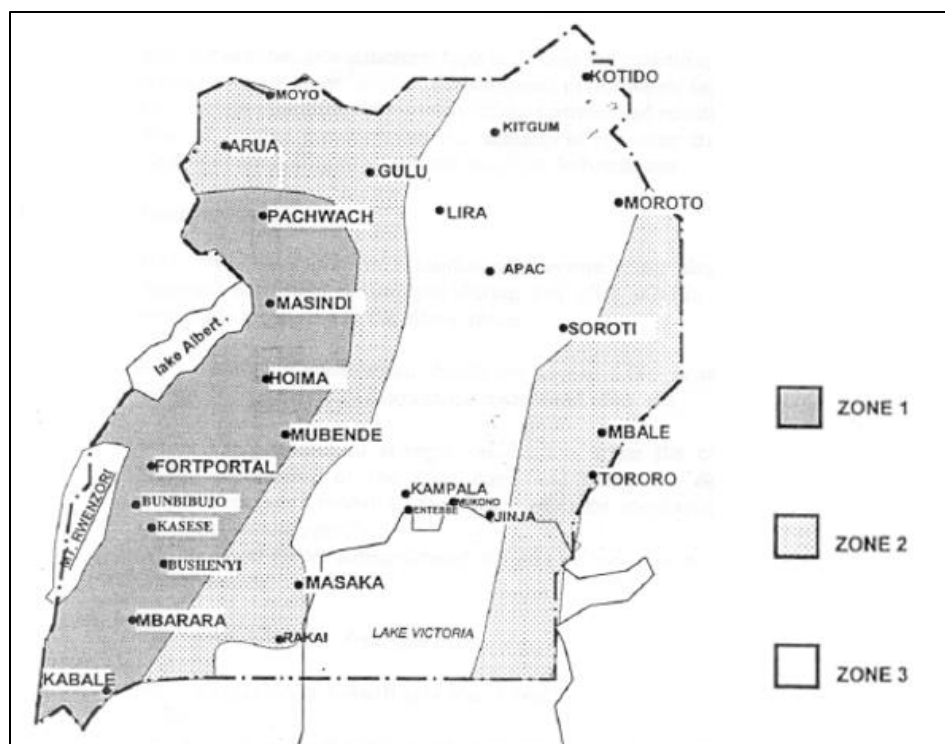


Figure 4-16: Seismic zoning for Uganda

Source: UNBS, *Seismic code of practice for structural designs*, 2003

4.4. Socio-Economic Baseline

4.4.1 Administrative structure

Kabarole District is Located in Western Uganda at a road distance of 300 km from Kampala the capital city. It borders with the districts of Bunyangabu in the south, Kamwenge in South East, Kyenjojo in the East, Bundibugyo and Ntoroko in the Northwest and Kibaale in the North east. Kabarole District lies between latitudes 00 15" N and 10 00" N and longitudes 300 00" E 310 15" E. It lies at an altitude of 1300 – 1800 masl.

Kabarole District has a total area of 1,814km² of which 1,569km² is covered by land and 198km² is covered by open water/wetlands. Arable land is 1,569km² and the area under cultivation is 1,307km². Kabarole District has one County (Burahya), the lower-level governments and administrative details are shown in the Table 4-27 below.

Table 4-27: Administrative units in the district are as follows

Municipalities	01
Number of counties	01
Number of Town Councils	05

Number of municipal Divisions	03
Number of Sub Counties	7
Number of Parishes and Wards	67
Number of villages	503

The seven Sub countries are:

1. Kasenda
2. Ruteete
3. Mugusu
4. Busoro
5. Kabende
6. Kichwamba and
7. Karangura

4.4.2 Location of Busoro Sub County

The Sub-County borders with East Division in the West, Harugongo Sub-County in the North West, Ruteete Sub-county in the South, Hakibaale Sub County in the North, and Bugaaki Sub-county in the East (Kyenjonjo District). It borders with KNP in the East which is shared between Kyenjonjo and Kabarole Districts. The sub county has 3 parishes and 32 village councils and the Table 4-28 below shows parishes and their number of respective village councils.

Table 4-28: Parishes and No. of villages

Name of parish	Kaswa	Busoro	Kirere
No. of village councils	17	8	7

The proposed site is located in the vicinity of Sebitoli A Village, Kaswa Parish, Busoro Sub-County in Kabarole District around coordinates 0.643652 30.385395 accessed through Sebitoli UWA Park Visitor Center gate as per Figure 4-17 below), along Fort portal-Kampala road.

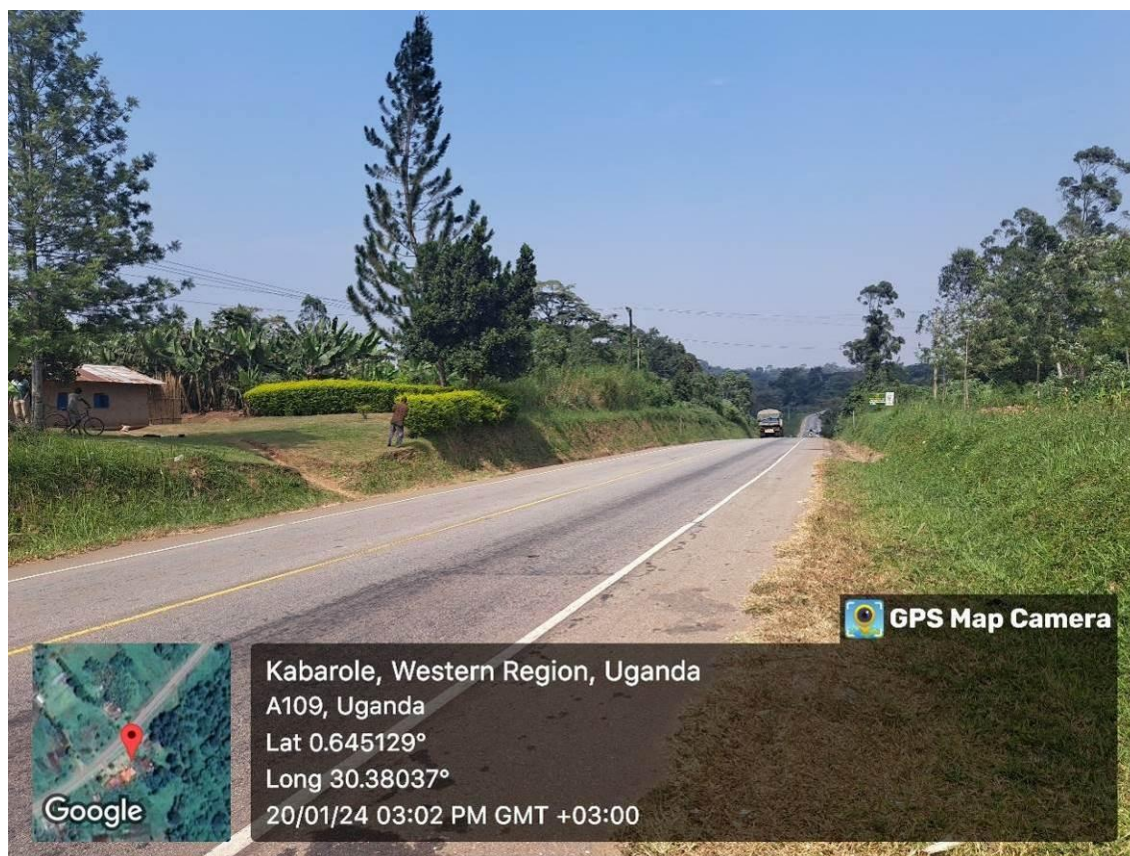


Figure 4-17: Access to the proposed site

4.4.3 Population and demographics

Population

As of July 2019, the projected population of Kabarole District stood at 462,176 individuals, with an average household size of 4.0 people (Kabarole District Local Government, 2020). Kabarole District exhibits a relatively high population growth rate of 2.37%, primarily driven by elevated fertility rates (exceeding six children per woman) and migration from neighboring districts such as Kasese, Kyenjojo, Kamwenge, and Ntoroko, coupled with a more rapid decline in mortality rates.

According to the 2021 Busoro Sub County Development Plan, the Sub-county is home to 32,721 people, comprising 13,088 males and 19,633 females. During the socioeconomic survey conducted for the ESIA, 51.9% of respondents were female, while 41.1% were male, falling within specific age brackets outlined in Table 4-29 below. Notably, a significant proportion of respondents (74.1%) identified as household heads. Among respondents above the age of 61, only one was male, with the remaining being female.

Table 4-29: Age brackets of respondents

Age brackets	% of respondents
	131

15-34	37%
35-45	18.5%
46-60	25.9%
Above 61	18.5%

As depicted in Table 4-30 below, the categories of 1-3 and 4-6 received a higher number of responses, followed by the 7 - 9 groups, while the 10-12 categories garnered only two responses.

Table 4-30: Number of people in Hhs interviewed

Category of Hh size	
1-3 people	10
4-6 people	10
7-9 people	5
10-12 people	2

The biggest number of respondents said they are in married monogamous marriages Figure 4-18 below.

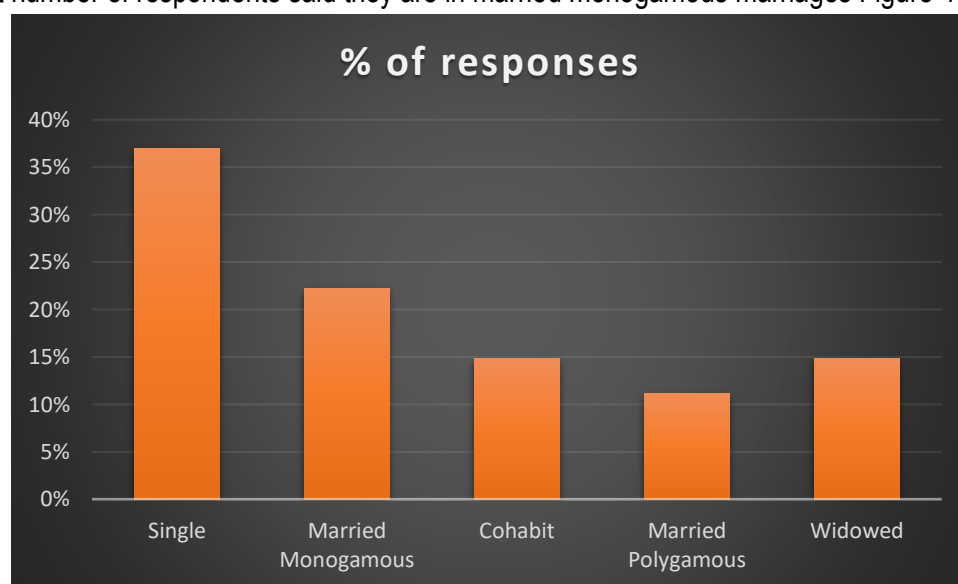


Figure 4-18: Marital status of respondents

It is expected that, throughout the project implementation phase, individuals such as children, the elderly, and single-headed household heads will not face increased vulnerability due to the presence of project workers in the village. Markedly, the age group between 46-60 garnered the highest number of responses, indicating a substantial population within the working age group. This suggests a significant potential for employment opportunities during project construction and an opportunity to involve this demographic group in leveraging the influx of tourists to the area. Although the construction phase is not likely to see many locals offered employment opportunities (since the project is small scale), locals however should be guided on how

to development local ecotourism to tap into the anticipated increase in number of tourists in the area as a result of operating the canopy walk.

Vulnerability

From the survey, it can be seen that people that can be considered to be vulnerable are respondents who were found to be above the age of 61. Single headed household members scored higher than the other marital status responses while the respondents above 61 were few (18.5%) compared to other age groups. Single headed household members may be considered vulnerable to a small extent the other groups that can be considered vulnerable in Sebitoli Village may include children, Persons with Disabilities and the mentally disturbed. Since there will not be resettlement of people for the project, the single/unmarried members of the community and elderly will not be directly affected.

However, all vulnerable persons will be at risk if project workers who might seek for accommodation in Sebitoli village misbehave (defilement and rape) and project drivers who might drive recklessly thereby causing accidents, loss of lives or early pregnancies, spread of STDs and STIs and domestic violence/marriage breakage among others. Mitigation measures to protect the vulnerable and other community members have been proposed in sections 7.8.7, 7.8.8 and 7.8.9.

Ethnicity

According to the District Development Plan of 2021, approximately 52% of the population in the district is comprised of the Batoro, Batuku, and Basongora ethnicities. The Bakiga make up 28% of the population, followed by the Bakonjo and the Bamba. The primary languages spoken in the district are Rutooro, Rukiga, and Runyankore. The findings from the socio-economic assessment conducted as part of the ESIA reveal that 92.6% of the respondents belong to the Batooro ethnicity, with the remaining percentage distributed among the Bafumbira and Banyankore. It is advisable to formulate key messages for project implementation using languages that the community is familiar and comfortable with. Additionally, the project implementing team should be attentive to and respect the cultural norms and traditions of the project area.

4.4.4 Housing and settlement

From the socio-economic survey, Sebitoli A village was noted to have a relatively medium population, with a significant portion of the village land being under crop farming, including plantains, tea, and cassava, moreover, from physical observation certain sections of the village are integrated into the KNP. Settlements were also observed to be clustered, with the majority of homesteads consisting of multiple structures accommodating different households, while many lined structures (for retail shops) were also established along the road. Figure 4-19 shows settlements in Sebitoli village, access to the proposed site and the proposed site as depicted by a google earth map. This is followed by a side view of houses seen during the assessment built of both permanent and temporary construction materials in Figure 4-20 respectively.

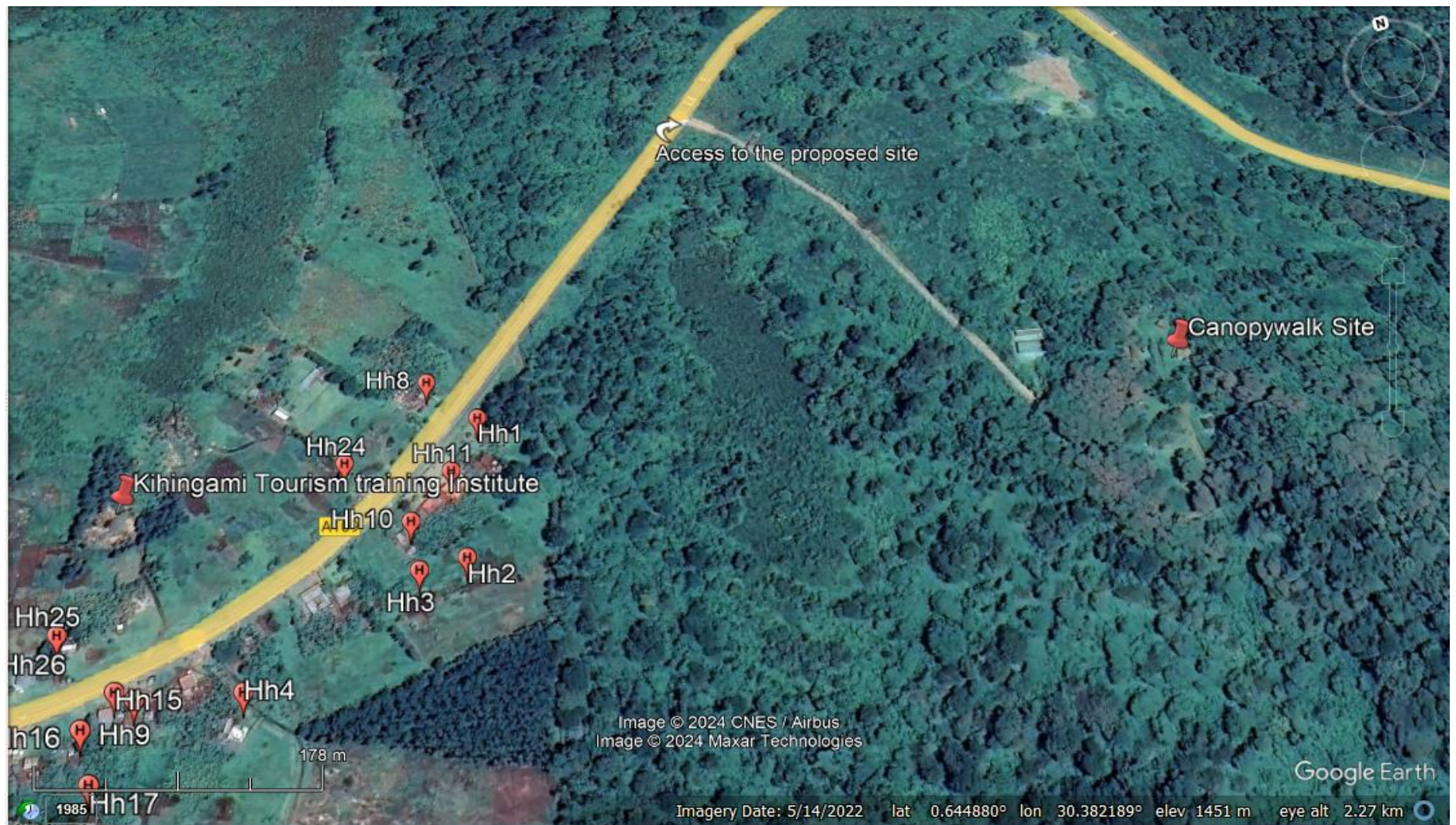


Figure 4-19: Showing settlements in Sebitoli village, access to the proposed site and the proposed site



Figure 4-20: Nature of housing in Sebitoli village

Anticipated impacts on housing facilities are not expected to be direct and negative, given the distance of the proposed site from homesteads and the size of the project workers. Indirect impacts on housing, such as potential accommodation shortages resulting from an increased population in the area, have been examined in the impacts analysis section (7.7.9), and corresponding mitigation measures have been suggested.

4.4.5 Land tenure and land use

Land tenure

In Kabarole District, there are four major land tenure systems: Customary, Freehold, Leasehold, and Mailo Land. Public land tenure is predominant for all protected forests, wildlife conservation areas, as well as areas accommodating government installations and establishments. Generally, there is limited land held under title, with customary ownership being the most common. This is attributed to the fact that many individuals in the region are peasants who find it challenging to bear the expenses associated with acquiring land titles or leases. In Kabarole District, the majority of communities individually own land under the traditional Karandara system (KDLG, 2021). The environmental and socioeconomic team verified that land in the project area is owned under both the freehold system (in the surrounding village-not project site) and public land (KNP-project site), as illustrated in Figure 4-21. The team gathered information indicating that most individuals own plots ranging from 3 to 4 acres, and both men and women have the right to own land.

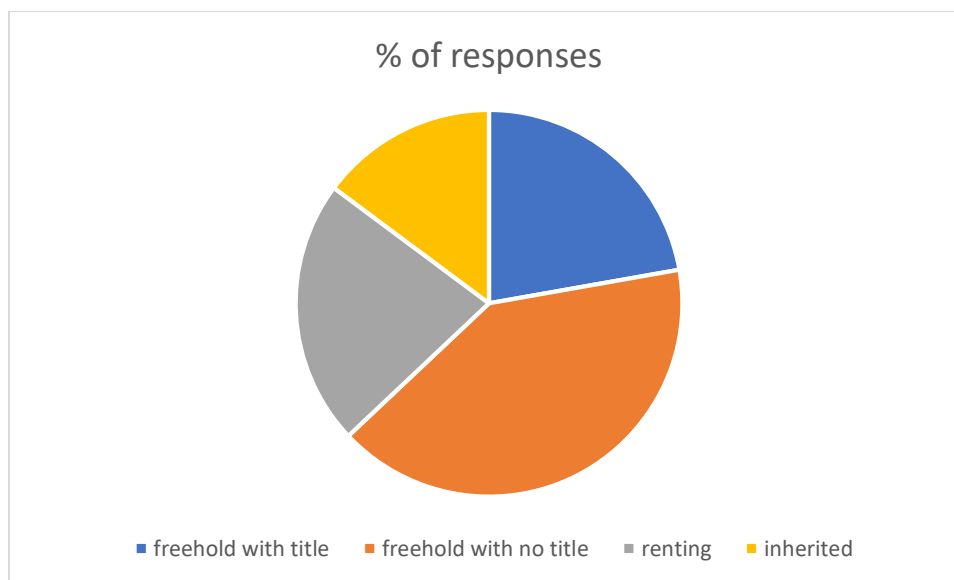


Figure 4-21: Land ownership status of interviewed households

The project will be developed within the National Park, and as such, there is no requirement for land acquisition. Therefore, no loss of land or change in land ownership is anticipated.

Land use

Agricultural land constitutes 84% of Kabarole District, while 11% is categorized as open water/wetlands. Forests cover 2%, national parks encompass 2%, and built areas make up 1%. Further categorization of land uses in the district (refer to Figure 4-22) includes Residential, Commercial, Industrial, Institutional, Recreational, Extractive, Civic, Agricultural Mixed Use (combining Agricultural and Residential), and Mixed Use (blending Commercial and Residential).

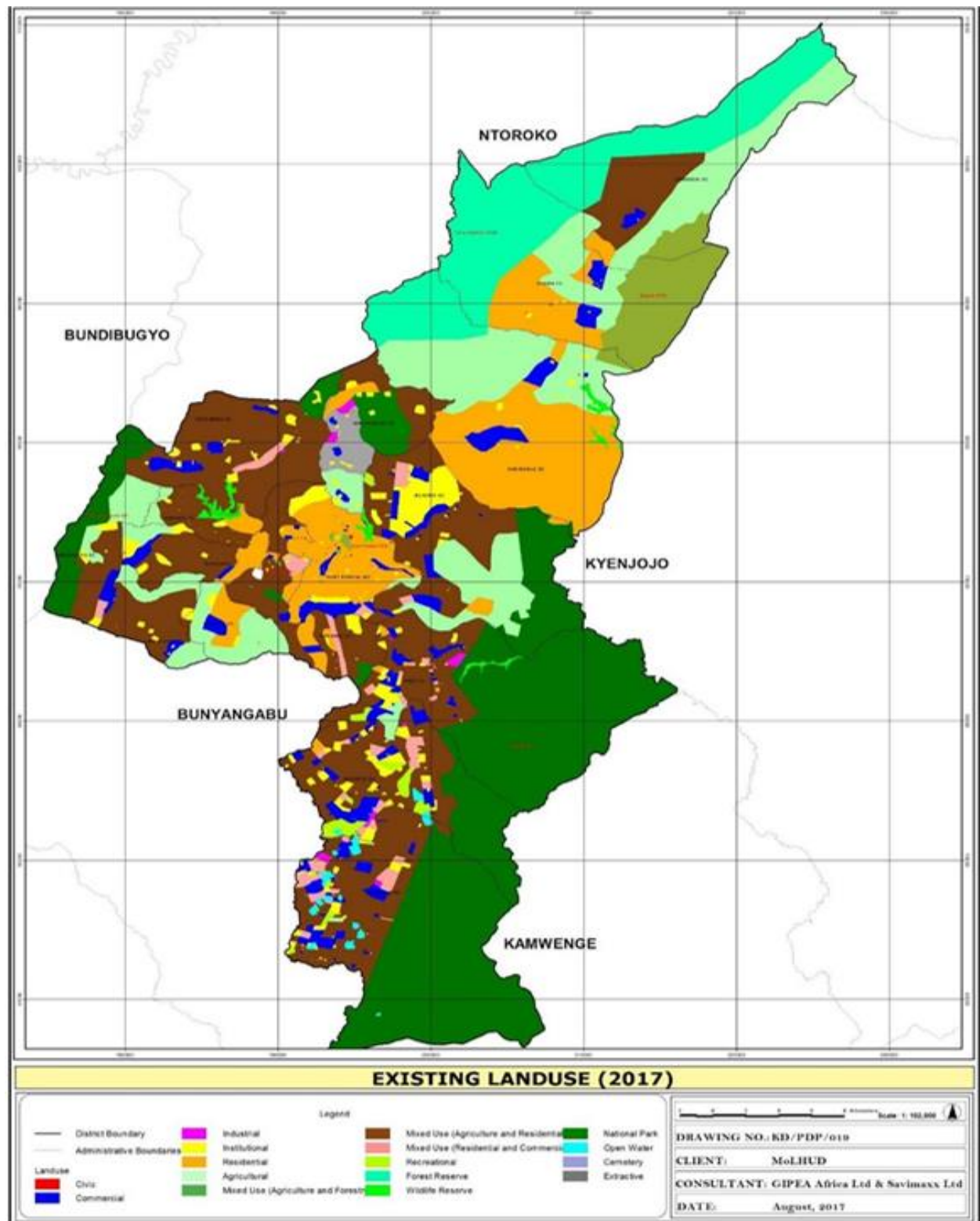


Figure 4-22: Map showing land use in Kabarole district

A significant environmental concern in the district arises from the reliance of over 95% of Kabarole District's population on fuel-wood as their primary source of energy. The majority of the land in both the village and the Sub County is dedicated to crop farming and tea cultivation, as illustrated in Figure 4-23 below.

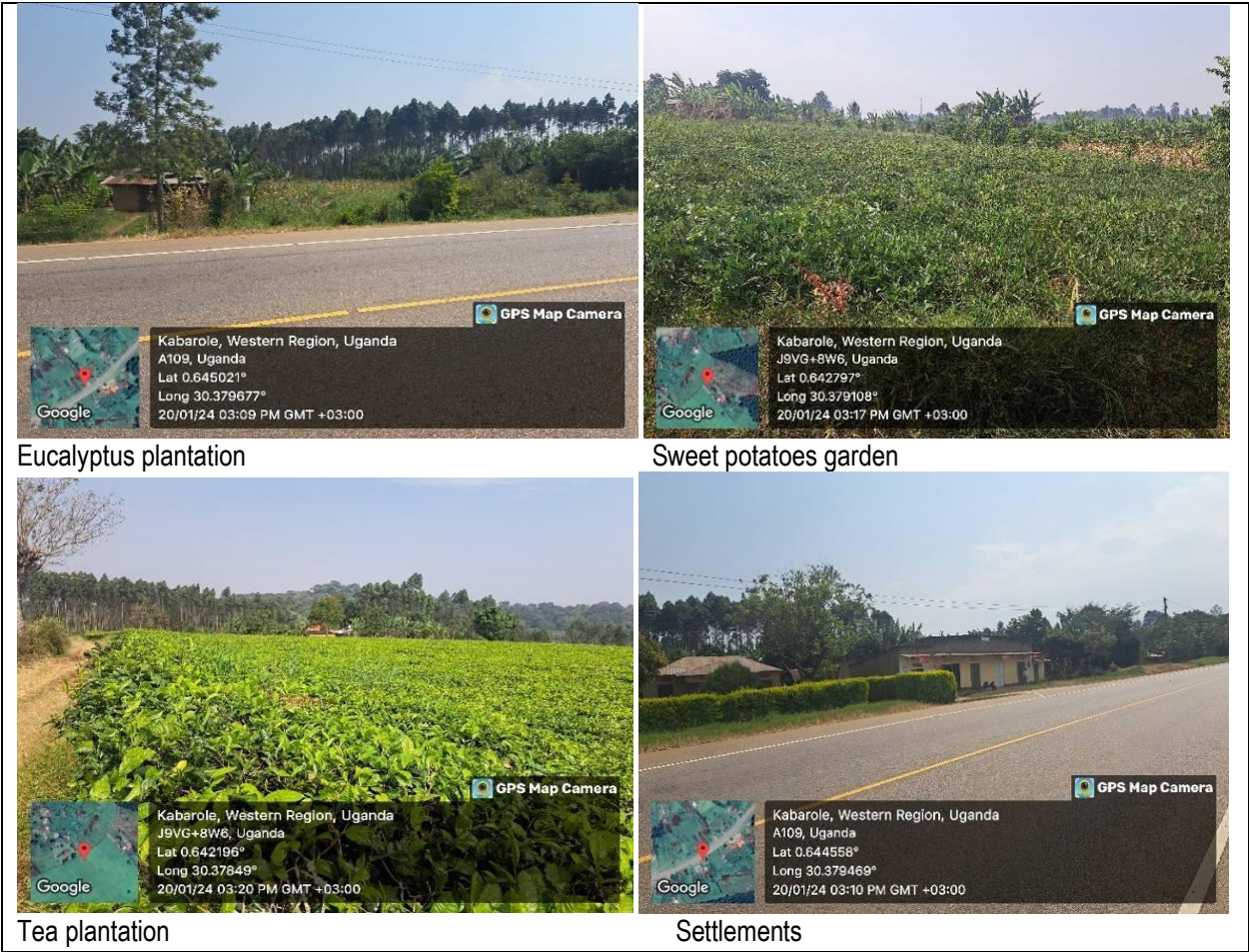


Figure 4-23: Land uses in Sebitoli village

Given that the project is set to be implemented on public land, the anticipated changes in land use are expected to involve activities initiated by the community or business individuals, such as developing tourist packages or engaging in secondary uses to derive benefits from tourism.

4.4.6 Livelihood activities

Subsistence farming serves as the primary means of sustenance for the rural areas of Kabarole. Cultivated crops include tea, coffee, cassava, bananas, and various vegetables such as tomatoes and greens. Livestock rearing is prevalent, encompassing goats, pigs, dairy farming, and commercial poultry farming, which are considered major enterprises in the district (KDLG, 2021). Key challenges in agriculture within the district

include low commodity prices, limited markets, inadequate road infrastructure, high market dues, and restricted extension services. Some communities in both rural and urban areas derive their livelihood from small-scale trade, involving the sale of general groceries and hardware. In rural areas, men predominantly engage in petty trade, while women focus on agriculture as their primary livelihood. Both men and women in rural and urban settings earn a livelihood by selling foodstuffs like cassava, sweet potatoes, greens, and matooke in local markets. Additionally, women in the district sale food items, second-hand clothes, charcoal, and search for employment in restaurants as sources of livelihood.

Government employment, jobs in the private sector, and work with NGOs are significant sources of livelihood in Kabarole district. Lucrative businesses like brick making and sand mining have flourished due to increased urbanization, attracting people to construct houses in peri-urban areas. Stone quarrying in Karangura, Bukuuku, and Ruteete Sub-counties involves women, youth, and men, with women crushing and selling stones, while men and youth engage in mining, selling, transporting, and acting as middlemen (KDLG, 2021). Furthermore, men and youth in peri-urban areas heavily rely on special hire, Omni taxi, and boda-boda (motorcycle) businesses as a primary livelihood strategy.

Men dominate employment circles due to higher education levels and better access to capital for starting businesses. Women primarily play a major role in agriculture, though they face challenges accessing land.

According to the Sub-county Development Plan (2021), subsistence farming is the primary livelihood source, with crops like coffee, bananas, beans, onions, vegetables, Irish potatoes, and sweet potatoes. The plan also notes cattle, piggery, goats, poultry keeping, and small-scale trade (hawking, retail shops, buying and selling agricultural produce, and second-hand clothes) as common livelihood activities. Engagement with local authorities revealed that in Sebitoli village, most people are employed in tea plucking at nearby tea plantations (Kiamara), shop-keeping, transport business (motorcycles), with only a few engaging in farming. The socio-economic survey results Figure 4-24 indicate that the majority of households' practice subsistence farming, with only a small percentage of 14.8% engaged in commercial farming.

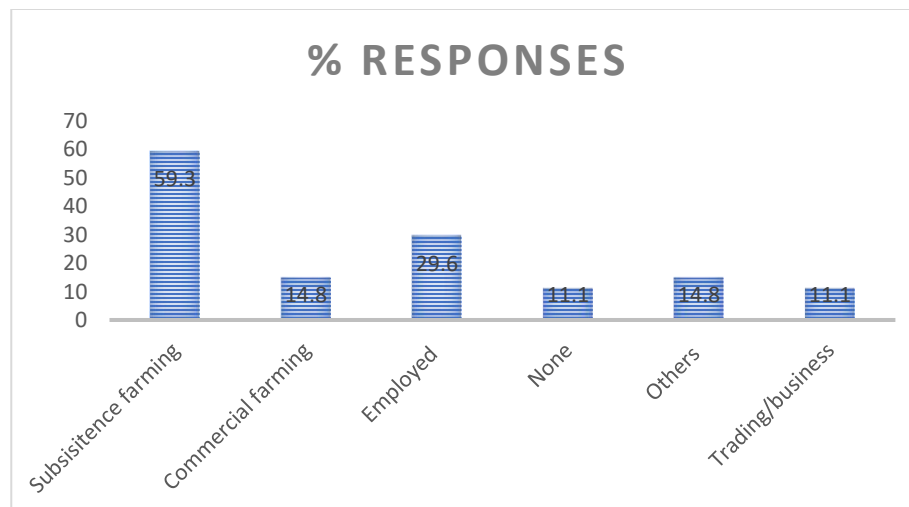
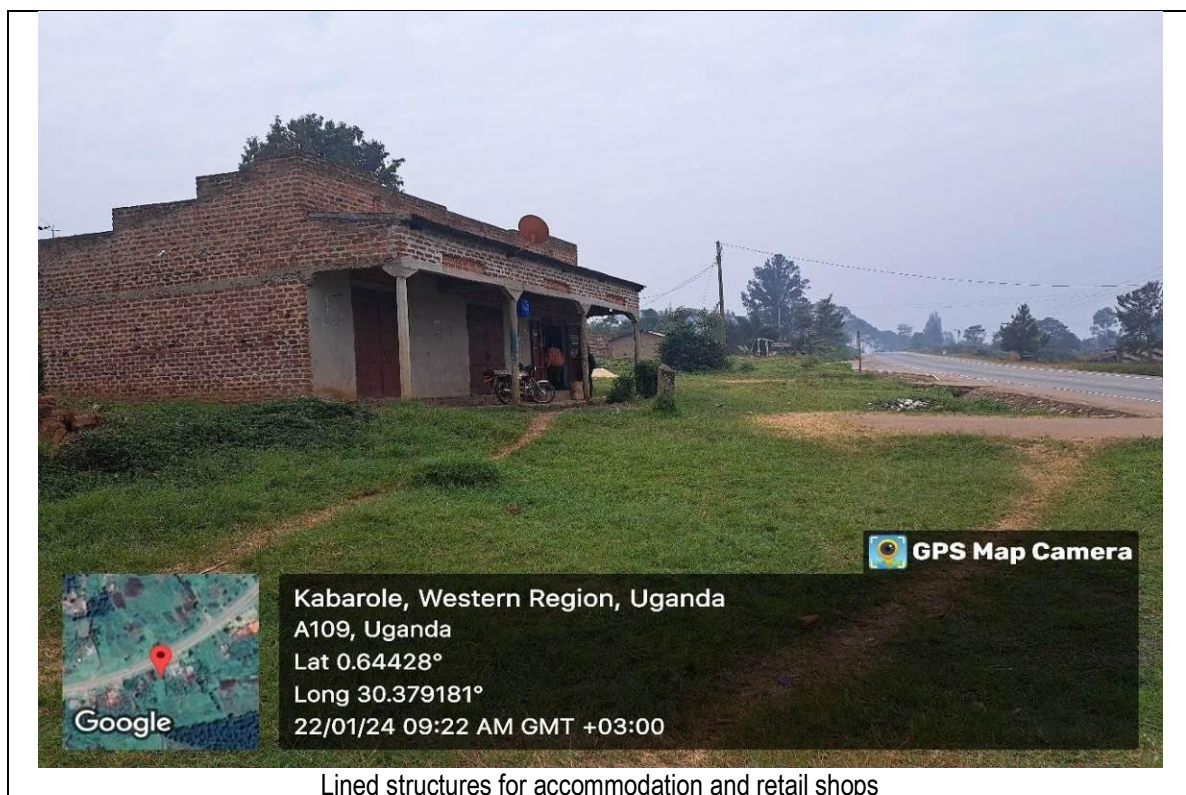
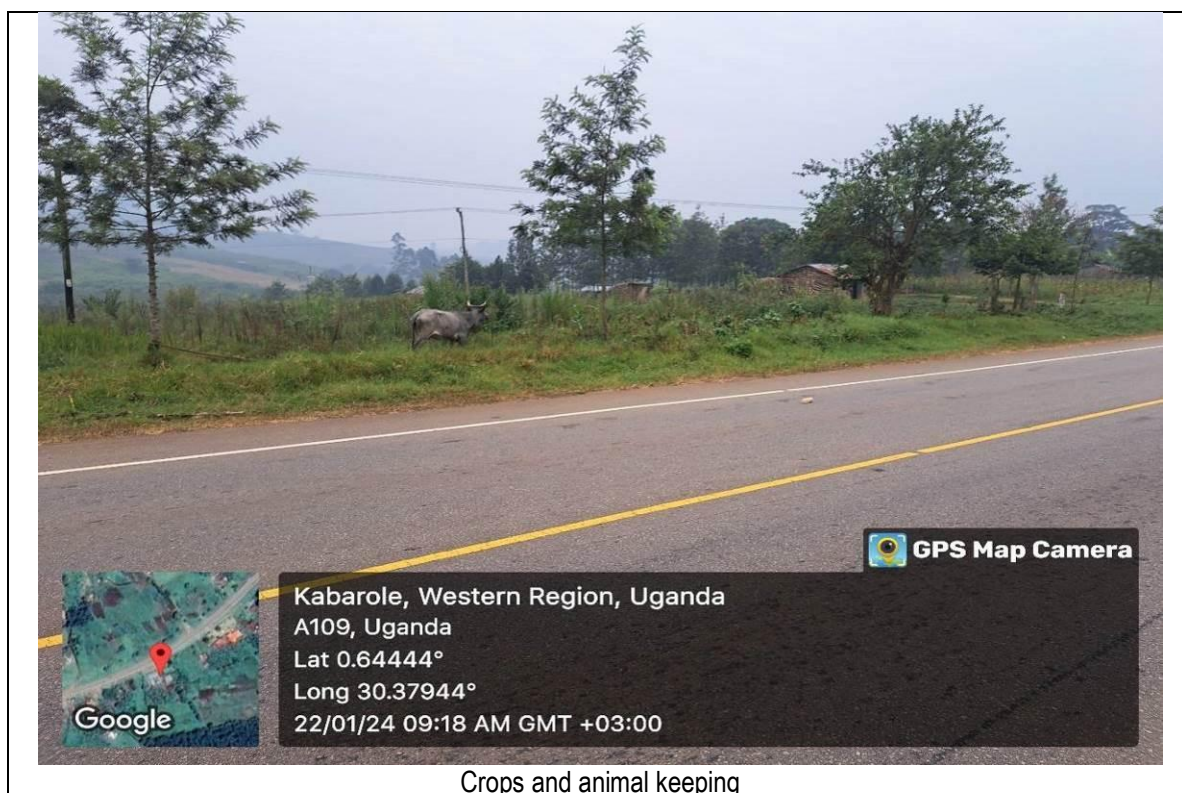


Figure 4-24: Livelihood sources for respondents

Others sources of livelihood mentioned included digging in individual community members gardens for a wage, tree planting to sell timber, livestock keeping, and craft making. Figure 4-24 above shows some of the economic activities in Sebitoli village and Figure 4-25 below shows the other activities recorded in the area.



Lined structures for accommodation and retail shops



Crops and animal keeping

Figure 4-25: Other livelihood sources

The stated livelihood sources will be positively affected by the proposed project, especially if the tourists to the canopy walk site visit Sebitoli village for other tourist products.

4.4.7 Tourism

The Ugandan picture

A Budget framework paper released in 2019 from MTWA indicated that over the past 10 years, tourist arrivals into Uganda had steadily increased from 850,000 in 2008 to over 1.4 million arrivals in 2017. Africa contributed the majority with Rwanda and Kenya sharing 31 percent and 24 percent of the total arrivals respectively. Although the proportion of leisure visitors to total visitor arrivals is still relatively small, it increased from 18 percent in 2016 to 20.1 percent in 2017 (MTWA, 2019). In 2017, Tourism led foreign exchange earnings to the Ugandan economy by generating USD 1,453 million compared to USD 1,371 million in 2016.

The direct contribution of Tourism to GDP in 2017 was UGX 2,699.1bn (2.9% of GDP) while the total contribution including wider effects from investment, the supply chain and induced income impacts, was UGX 6,888.5bn in 2017 (7.3% of GDP), up from UGX6, 171.5bn in 2016. In 2017, out of 1.9 million total arrivals, 1.4 million (73%) were visitor arrivals. The number of visitor arrivals marginally increased between 2014 and 2017 Table 4-31 (UBOS, 2019).

Table 4-31: Visitor arrivals to Uganda by purpose of visit (000') 2014-2017

Purpose of visit	2014	2015	2016	2017
Leisure, recreation and holidays	220	208	238	281
Business and professional conferences	232	322	315	403
Visiting friends and relatives	441	453	466	492
Others	373	320	304	226

UBOS, 2019

A survey conducted by the Ministry of Tourism, Wildlife, and Antiquities (MTWA) in 2012 revealed that leisure and cultural tourists tend to spend 30 to 100 percent more than other types of tourists during their visits to Uganda. This substantial variance in spending makes these tourists an appealing target in government initiatives to enhance the economic contribution of the tourism sector, underscoring the significance of bolstering the marketing of Ugandan tourism. The survey approximated that around 500,000 foreign tourists spent at least one night in Uganda in 2012, and nearly 75,000 of them were classified as leisure or cultural tourists. In 2013, over one million nonresidents visited Uganda, and it is estimated that about half of them stayed at least one night (MTWA, 2012).

According to the 2014-2024 Uganda Tourism Master Plan, among leisure tourists, 39% engage in wildlife safaris, 26% come to see gorillas, 25% seek adventure/activity tourism, and 17% are backpackers. Backpackers, in particular, tend to have a longer average stay of 20 days compared to less than 14 days for the average leisure tourist. Although they spend less per day, with a total expenditure of \$1,160, including \$1,438, or \$105 per day, and \$176, respectively, their longer duration often makes them pioneers in the tourism sector, with their expenditure more likely to reach communities and the rural sector. Hence the packaging of this product should target the stated tourist types to maximize revenue.

Most leisure tourists originate from Europe (46%) and North America (22%). African tourists primarily visit Uganda for business or meetings, with the majority staying less than a week (75% stay less than a week). However, a small percentage extends their stay for up to six months, usually for educational purposes from elsewhere in the region. In the process of developing and promoting tourist packages, it is imperative for UWA, KDLG, and the local community to identify activities and attractions that are likely to appeal to leisure tourists and backpackers. These groups, based on existing literature, tend to have longer stays and contribute more significantly to the local communities.

Kabarole picture

Kabarole District stands out as a premier tourist destination in Uganda, celebrated for its favorable climate, stunning environment, biodiversity, cultural richness, and the warm hospitality of its people. The district



boasts a range of attractions, including freshwater sources that, if properly developed, could support thriving water-based tourism. Notable national parks like Kibale and Mount Rwenzori, along with captivating weather and picturesque landscapes, add to its allure. With over 150 hospitality and accommodation facilities providing around 2,100 rooms, of which 24% offer moderate services and 5% meet international standards, the district ensures a variety of options for visitors. Importantly, 85% of these accommodations are owned by Ugandan citizens (KDLG, 2021).

The private sector plays a pivotal role in driving the flourishing tourism sector in Kabarole, attracting approximately 13,000 tourists annually to explore the two national parks. However, there's a recognized need to enhance investments in the tourism sector to further draw visitors and maximize economic benefits. Tourists engaging in activities at Kibale National Park currently enjoy experiences such as chimpanzee trekking, chimpanzee habituation, nature walks and hiking, visits to Bigodi Wetland Sanctuary, birding in the park, crater lakes tours, and exploration of Amabere Ganyina Mwiru. Table 4-32 below presents the visitor statistics to Kibale National Park over the past 12 years, highlighting the growing interest in this remarkable destination.

Table 4-32: Summary of Visitation to Kibale National Park for the Past 12 Years (2011 to 2022)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Total number of tourists	7,530	10,372	10,834	12,097	10,463	11,760	15,728	18,843	19,521	5,558	7,789	15,641

Source: UWA records at Kanyanchu Tourism center

The envisioned canopy walk is anticipated shall contribute to a rise in tourist arrivals both nationally and within the district. The local community stands to gain directly from this initiative, especially considering the current limited engagement in tourism-related activities. According to the results from the ESIA socioeconomic survey, only a small fraction 25.9% of community members in Sebitoli village are currently involved in such activities. This is in contrast to the awareness level, as revealed in the survey, where 74.1% of respondents acknowledged the allure of the park and its wildlife as tourist attractions.

State of the existing human-wildlife interaction/conflicts, effects on nature and the local community causes, and strategies for co-existence?

Around KNP in western Uganda, communities continuously face the threat of crop damage from wildlife, from a variety of wildlife, such as elephants and chimpanzees. The need to constantly guard the gardens and the losses faced result in economic instability, health risks, and frustration with wildlife. As a result, farmers may injure or kill animals when they are consuming or damaging crops in the garden. With the increasing frequency of crop losses, the economic benefits of living near the park—mainly tourism and ecosystem services—become overshadowed (as was pointed out in the community meeting). These frequent negative



interactions with wildlife lead many community members to resent the park and the animals that live within it. The attitudes of community members living around protected areas are an important and often overlooked consideration for effective conservation strategies. (Kolinski and Milich, 2021).

Results of the socio-economic survey show that all respondents said wild animals including Chimpanzees, elephants, monkeys, and baboons visit places where the respondents work or live majorly attracted by crops (sweet potatoes, cassava, beans, maize, matooke, yams, Irish potatoes, millet, ground nuts). None of the respondents found any advantage of these animals coming near their gardens or homes. 81.5% said the visits by wild animals to gardens and homes have increased over the last 5-10 years, while only 3.7% said the raids had decreased and the rest were not sure whether there was an increase or decrease. A copy of results of an assessment conducted by the LC1 Executive on wildlife raids in the community in June 2023 is attached to this ESIS (Appendix 3(b)).

Presented in Table 4-33 are measures proposed by respondents to the socio-economic survey ways to reduce human-wildlife conflicts.

Table 4-33: Respondents proposed measures to reduce human-wildlife conflicts

Proposed measures to reduce raids
Employing Security guards around the park to ensure regular monitoring
Install electric fences
Work with LC 1 defense committee
Trenches should be wider
Control poaching
Limit deforestation

The respondents said there are already ongoing conservation initiatives in the area (though most of the respondents were not involved in any conservation initiatives-63.1%) including tree planting, trench digging, sensitization of locals to stop poaching, bush burning, and working on chimpanzee projects.

i. District officials' recommendations on measures to minimize human-wildlife conflicts;

- Aside from digging trenches around the park, UWA should consider and plan to install an electric fence to further minimize human-wildlife conflicts.
- UWA is advised to revise the condition on use of the 20% revenue given to human-wildlife conflicts affected sub-counties. The local community would appreciate the park more if the 20% is used to invest in community tourism activities/facilities because at the moment the community feel using the money to dig trenches isn't compensation enough.
- Work with Local Government to resolve conflicts arising from wildlife.
- Sub-counties have community wildlife groups through which tourism investments can be implemented.

ii. District and sub-county recommendations on how local community can be helped to benefit from the expected increase in tourism numbers;

- Help the local community to promote community tourism (including homestays, craft making, and selling, restaurants and hotels, etc), hence the reason why this project should be implemented is that at the moment local community members in Sebitoli village are not benefiting much from tourism.
- Continued sensitization of the community about tourism benefits so that they appreciate benefits from tourism.
- UWA should continuously involve the local community as the project is being implemented.

iii. Comments from UWA officials at the Sunga office on human-wildlife conflicts and how the community can tap from tourist activities

- Human-wildlife conflict causes are dynamic and are constantly on the increase. Currently, the increase in population is putting pressure on the forest edges which leaves less land for animals to range. There is thus the need to sensitize communities about population control.
- Currently trenching is being done as a measure to control human-wildlife conflicts.
- Guidelines/Regulations where revenue sharing and use by lower local government is catered for were updated in 2020, hence they can't be reviewed immediately.
- The community can engage in eco-tourism activities such as crafts making, and offering low-cost accommodation, all these activities can be advertised by UWA.

iv. Local community proposals on human-wildlife conflict management

- To minimize human-wildlife conflicts, the locals should be advised to develop alternative livelihood sources that will attract tourists, so that locals will not be completely reliant on farms. Some examples of tourist facilities are lodges, dance groups, restaurants, handicraft-making shops, etc. Diversification will be important.
- Once high revenue from the canopy walk is obtained, UWA should install an electric fence so that animals remain in the park.
- Sebitoli Women Cultural and Conservation Group is registered at the Sub-county and requested to be trained in diversifying to have many tourist products to sell.
- Chimpanzee Wildlife Friends Association requested that a box should be at the UWA Sebitoli sector offices so that visitors to the canopy walk drop in some money to facilitate the Association activities which include guarding local farms against animal raids, trench maintenance, digging pit latrines for residents.
- All gender in the village should be trained in product diversification.

Existing tourism related livelihood activities carried out by the communities

From stakeholder engagement results and observation during site inspection, it can be stated that tourism related livelihood activities by carried by local community in Sebitoli Village are almost non-existent. Two



tourism facilities were observed in the area, one crafts/honey selling shop and the Kihingami Tourism Training Institute (Figure 4-27).

Data captured during the socio-economic survey indicates that most people in the area are not engaged in any tourism activities, as 59.3% of the enumerated households said they don't take part in any tourism activity for livelihood, while 25.9% said yes and 14.8% gave no response.

Those who responded yes, mentioned craft making for selling, bee keeping for honey harvesting and selling as the activities they are engaged in. All respondents replied yes to the question as to whether the proposed canopy walk would lead to an increase in tourism numbers to Sebitoli.

Activities local community can engage in to tap from tourists to the project area

Respondents to the questionnaire were asked activities they thought local community could engage in to ensure that they benefit from tourists visiting the canopy walk and presented in Table 4-34 are the eco-tourism businesses.

Table 4-34: Tourism activities local community can engage in

Activity
Art and design
Sell of organic vegetables and honey, goats' meat, eggs, spices, sweet bananas
Drivers
Tour guiding
Crafts making
Hotels/restaurant
MDD

The respondents said locals being friendly to tourists, selling different products (crafts cultural dances and drama etc), being welcoming and hospitable, being cooperative with different stakeholders, educating children and preserving the beauty and environment of the area could aid in ensuring increase in number of tourists to Sebitoli area and Kabarole district.

According to UWA and Kabarole District Local Government Officials, local community around KNP must identify community tourism activities that they can engage in and ensure the activities/products are adequately packaged to attract tourists. Literature shows that Community-based tourism is a way of sustainable tourism that allows travelers to closely connect to local communities with the aim of directly

benefiting local communities financially, while travelers experience the local way of life. It should be noted that community-based tourism is a very sensitive segment. That's why, it's essential that it's developed and operated correctly to ensure actual benefits for the local communities. It's a growing niche market, as more and more travelers are looking for authentic experiences that create benefits locally. (Anne de Jong, 2023). Some of the widely known community tourism experiences are;

- Cooking and tasting local food
- Visiting a local market
- Walk through the village
- Working on the field
- Experiencing the coffee process (tea harvesting in the Kabarole case)
- Fishing or sailing with locals
- Biking tour around the village
- Handcrafting or painting
- Storytelling by elders
- Homestay or farm stay

Therefore, while Kibale National Park is primarily known for its Chimpanzees and other primate species, it also offers and can increase what it offers to visitors through unique opportunities to engage in a variety of community activities. These activities will not only enrich the visitors experience but also contribute to the sustainable development, reduce on negative human/wildlife interactions and to conservation efforts of the local communities.

4.4.8 Social Infrastructure and services

Educational institutions and enrolment

Table 4-35 below shows a total of 273 schools in the district, of which 48 were universal primary schools, and 05 were government-aided secondary schools, 110 private primary schools, 92 early childhood development centers (ECD), 15 private secondary schools, 01 technical college and 03 technical schools (KDLG, 2021).

At the county level, Kasenda S/C registered the highest number of primary schools. The sub-counties of Mugusu, Harugongo, and Busoro have no secondary schools.

Table 4-35: Number of schools per administrative unit

County Sub County	No of Schools	No of primary	No of Secondary Schools	ECDs	Tertiary
BURAHYA	273	158	20	92	3

County Sub County	No of Schools	No of primary	No of Secondary Schools	ECDs	Tertiary
KABENDE	32	15	01	16	0
MUGUSU S/C	15	09	0	06	0
HARUGONGO	14	09	0	05	0
KIBASI T.C.	20	10	01	08	01
HAKIBAALE	24	11	01	12	0
KIJURA TC	17	09	01	07	0
KIKO TC	07	05	02	0	0
MUGUSU T.C.	15	06	02	07	0
RUTEETE	16	13	03	0	0
BUSORO	05	04	0	0	01
KICWAMBA	44	23	04	16	01
RWENGAJU	12	06	01	05	0
KARANGURA	25	14	01	10	0
KASENDA	27	24	03	0	0
KABAROLE DISTRICT	273	158	20	92	03

Listed here are some of the schools where pupils and students from Sebitoli A village go for education; Hope P.S, Kiamara P.S (Figure 4-26 below) in Kiamara village, Kitumba S.S, Mpanga S.S, Fortportal S.S, Kahingi S.S and Kamengo S.S among others. 55.6% of respondents to the socio-economic survey during ESIA said they had stopped at primary school level of education, 25.9% at stopped at secondary and 7.4% had attained tertiary education. The Head Teacher of Kiamara Primary School told the ESIA team that in third term 2023, the school enrolled 516 pupils, 275 of them boys and 241 girls.



Figure 4-26: Kiamara Primary School

Kihingami Vocational Eco-Tourism Training Institute (Figure 4-28 below) is located about 800m from the proposed site and 400m from the access road to the project site/UWA Sebitoli Visitor's Center.



Figure 4-27: Kihingami Vocational Eco-tourism Training Institute

Kihingami Vocational Eco-Tourism Training Institute and such entities can partner with other stakeholders (Government and Private Companies) to sensitize the local community about benefits that can be accrued from the proposed Canopy Walk. No education institutions shall be affected by operations at the proposed site.

4.4.8.1 Health facilities and status

In total the District has 19 public health facilities providing general health services of which 12 are HC III and seven are HC IIs. The district plans to upgrade Ruteete HC III to HC IV and Kidubuli HC II to HC III. Table 4-36 shows health facilities in Busoro Sub-County.

Table 4-36: Health Facilities in Kabarole District

Facility Name	Level	Ownership	Location
Buzirasagama HC II	HC2	PNFP	Busoro Sub county

Facility Name	Level	Ownership	Location
John H & Marie Parish medical clinic HC II	Clinic	PNFP	Busoro sub county
Kaswa HC III	HC3	Government	Busoro sub county
Kiamara HC II	HC2	PNFP	Busoro sub county
Kirere HC II	HC2	Government	Busoro sub county
Mpanga Tea Estate HC II	HC2	PNFP	Busoro sub county
Ngombe Orthodox HC II	HC2	PNFP	Busoro sub county

Source: KDLG, 2021

According to the district development plan (KDLG, 2021), 32.8% of the Households in Kabarole district move a distance of more than 5km radius in order to access any public health facility.

Local community in Sebitoli A village said they go to Kaswa Health Center III (Figure 4-28 below) for medical attention and that the most common illnesses they report with at the health center are cough, flu, malaria, HIV and TB. The health center is located around coordinates 0.642058 30.34173, about 5km away from the proposed site.



Figure 4-28: Kaswa HC III

A review of the Kaswa HC Out Patients Department (OPD) daily register for November and December 2023 showed that 28 patients (each month) were received at the health center from Sebitoli village reporting diseases including malaria, scabies, allergies, hypertension, cysts, UTIs/STIs, gastro disorder, bronchitis/cough, arthritis, hemorrhoids, intestinal worms, eye diseases, and dermatitis. In both months the commonest disease was acute bronchitis followed by malaria. No human/animal related diseases were reported to be recorded at the health center during the ESIA studies.

ESIA team recommends that bio-data for all visitors be kept at the campsite, monitoring of the animals, and that all workers should be periodically medically checked.

5 STAKEHOLDER PARTICIPATION, ISSUES AND CONCERNS

5.1 Approach

The community and stakeholder engagement regarding the CW-in-KNP encompassed all expressed views, opinions, concerns, and recommendations provided by the respective participants.

Stakeholder engagement plays a pivotal role in the successful completion of the CW-in-KNP project ESIS. The ESIA team actively interacted with all stakeholders to apprise them of the project and the ESIS development process. This engagement aimed to gather valuable feedback for improving the project's development. Consequently, this document identifies the stakeholders consulted throughout the ESIS preparation process. It outlines the various stakeholder engagement activities conducted, and an appended list includes individuals from institutions, communities, and groups who participated in these interactions. Stakeholders here refer to all those people and institutions or groups with interest in the successful design, implementation, and sustainability of the project.

5.1.1 Scope

Engagement with stakeholders for the project commenced in late 2021 and this continued throughout the ESIA process. It is imperative to recognize the pivotal role of UWA's practices in effectively involving stakeholders, and this approach will persist beyond the ESIA process. The emphasis will be on proactive engagements that seeks to provide timely information and create opportunities for active participation by all stakeholders in the development of the project.

5.2 Public engagement

Public consultations and engagement are a key part of the Environment and Social Impact Assessment (ESIA) process to ensure collective involvement of stakeholders in the proposed project. Stakeholder engagement can be described as the systematic effort to understand and involve stakeholders and their concerns in the project activities and decision-making processes. Stakeholders are defined as any group or individual who can affect or can be affected by the project, influence the project or have interest in the project.

For projects that have environmental and social impacts, consultation and engagement is not a single conversation but a series of opportunities to create an understanding about the project among those that are likely to be affected or might have an interest in it, and to learn how these stakeholders view the project and its related risks, impacts, opportunities, and mitigation measures. Gathering stakeholder concerns and feedback can be a valuable source of information to help identify environmental and social risks (real and perceived) and improve project design and outcomes of the ESIA and the project.

5.3 Objectives of stakeholder engagement

Stakeholders were engaged during the ESIA process as a suitable avenue to provide relevant and adequate information and to obtain stakeholders perceived/real positive and negative social and environmental impacts. Specifically, consultations were undertaken in order to;

- i. Explain the project and create awareness;
- ii. Ensure Compliance with both national regulations and international best practice
- iii. Obtain baseline environmental and social conditions in the proposed project area based on local knowledge;
- iv. Obtain perceived/real economic, social and environmental benefits that can be enhanced during project implementation and operation;
- v. Obtain the perceived/actual potential negative environmental and social impacts so that they can be mitigated;
- vi. Provide equal opportunity to stakeholders to get involved in project planning;
- vii. Manage Expectations and Concerns: by providing a mechanism for stakeholders to engage with the Project about their concerns and expectations and provide a mechanism for receiving, documenting and addressing comments received;
- viii. Build trust with the stakeholders by establishing and managing relationships throughout the construction and operation process of the project.

5.4 Stakeholder engagement and consultation requirements

5.4.1 National requirements

Stakeholder engagement has been undertaken in accordance with the National Environmental Act 2019, as well as with the National Environment (Environment and Social Assessment) Regulations for Uganda 2020- Part III (regulation 13- c and d) regulation 16; Stakeholder consultation/engagement were undertaken as part of the ESIA activities to gather views and concerns of the stakeholders with regard to the proposed project. Regulation 16; Stakeholder consultation during the environmental and social impact study, the Regulation guides that;

- (1) The developer shall, in undertaking the environmental and social impact study, carry out consultations with relevant stakeholders, communities likely to be affected by the project and the public.

Under Sub-regulation (2) The developer shall, in undertaking consultations under this regulation, establish a systematic approach to stakeholder engagement to —

- (a) build and maintain a constructive relationship with the stakeholders, particularly persons and communities likely to be affected by the project;

- (b) assess the level of stakeholder interest and support for the project;
- (c) provide means for effective and inclusive engagement with project-affected persons and communities throughout the project life cycle on issues that could potentially affect them; and
- (d) ensure that appropriate project information on environmental and social impacts or risks is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format, well in advance of the proposed consultations.

(3) The developer shall, in carrying out the consultations under sub-regulation (1)—

- (a) choose the mode of consultation, considering the nature and location of the project and the key issues to be consulted on;
- (b) give advance notice of the proposed consultation, with a minimum notice of seven days;
- (c) hold meetings with relevant stakeholders, communities likely to be affected by the project and the public to explain the project, its likely benefits, likely negative impacts and proposed mitigation measures, and to receive their oral or written views;
- (d) where the consultations involve holding meetings, ensure that the venues of and time for the meetings are convenient to the relevant stakeholders, communities likely to be affected by the project and the public; and
- (e) ensure that the comments received during consultations are recorded, made publicly available and considered during the environmental and social impact study.

The ESIA review process also provides an opportunity for key stakeholders and the public to make an input to the EIS study, through comments on the content and adequacy of the ESIA report, or through a public hearing, if the authority – NEMA, decides so.

5.4.2 World Bank requirements

The Environment and Social Framework document, ESS 10 states that;

- Developers will engage with stakeholders throughout the project life cycle, commencing such engagement as early as possible in the project development process and in a timeframe that enables meaningful consultations with stakeholders on project design. The nature, scope and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impacts.
- Stakeholders will be engaged in meaningful consultations and that they will be provided with timely, relevant, understandable and accessible information, and consult with them in a culturally appropriate manner, which is free of manipulation, interference, coercion, discrimination and intimidation.

- The process of stakeholder engagement will involve the following, as set out in further detail in this ESS: (i) stakeholder identification and analysis; (ii) planning how the engagement with stakeholders will take place; (iii) disclosure of information; (iv) consultation with stakeholders; (v) addressing and responding to grievances; and (vi) reporting to stakeholders.
- The developer will maintain, and disclose as part of the environmental and social assessment, a documented record of stakeholder engagement, including a description of the stakeholders consulted, a summary of the feedback received and a brief explanation of how the feedback was considered, or the reasons why it was not.

Records of meetings/engagements held with stakeholders both during the scoping and ESIA studies phases are presented in section 5.5.2 and 5.5.3 below.

5.5 Stakeholder identification and analysis

It is fundamental that stakeholder engagement and consultation during the ESIA process is meaningful (i.e. free, prior and informed), and that the borrower or client is ultimately able, through such stakeholder engagement, to achieve Broad Community Support (BCS) for the project. The first step in the public participation and stakeholder engagement process was to identify key stakeholders that are relevant in the planning and implementation of this project.

A systematic approach to identifying affected/interested stakeholders is considered best practice. First the project's geographic sphere of influence was delineated in the Scoping exercise.

Stakeholder analysis considered:

- Who is affected by the Project and how;
- Each stakeholders' key interests and concerns in relation to the Project;
- The mandates of each of the stakeholders, where applicable, that relate to project development, implementation and operations and
- How different stakeholders can influence the Project and what risks or opportunities this presents to the Project.

Stakeholders important to the project were identified and analyzed in respect to location, interest, mandate, influence, taking level of literacy and potential mode of engagement into consideration. The criteria are explained below;

- i. The location criterion was used in respect to the administrative units where the project falls hence these were considered as primary stakeholders.
- ii. Interest criteria was used in analysis to refer to the level of concern and significance of the project to particular stakeholders.
- iii. Mandate refers to the consideration for the level of directive reasonability the stakeholder has in respect to the project or the affected project sites. This is usually considered together with influence which implies the ability or powers to influence, encourage and discourage project activities.

Potential adverse and beneficial impacts on the socio-economic and environmental aspects were discussed with the stakeholders including some of the following:

- Potential benefits deriving from the Project including direct and indirect income source, revenue for the country and local governments
- Environmental sensitivities (biodiversity);
- Impacts on public health and safety;
- Impacts on amenities, services and public infrastructure;
- Impacts on livelihood sources and businesses;
- Potential disturbance from noise, and dust pollution;
- Impacts on social cohesion.

The stakeholder groups were defined during the identification process i.e. primary level stakeholder (considered to be high influence and power in respect to the project, project area and project implementation- community members in nearby villages, village councils where the project falls). These were followed by secondary level stakeholders (such as beneficiaries of the project i.e. MTWA, UWA, Uganda Tourism Board (UTB), Kabarole District Local Government and Busoro Lower Local Government, Tour Operators Association) and the tertiary stakeholders or other interested stakeholders (considered important but have low power and low influence-Department of Occupational safety and Health and others are likely to arise in the course of project implementation).

The mandate, interest, and location were arrived at after reviewing relevant policies, legislation, and the institutional framework for the tourism sector in Uganda, consultations with lead agencies, and at local levels. The links between stakeholder feedback and the constituent elements of the ESIA must be demonstrated, reflecting attention to stakeholder concerns and perspectives (Table 5-1).

Table 5-1: List of project relevant stakeholders

Stakeholder	Information requirement
Ministry of Tourism, Wildlife and Antiquities (MTWA)	The mission of the ministry is to develop and promote tourism, wildlife, and heritage resources for the enhancement of Uganda as a competitive and preferred tourist destination, with accelerated sector contribution to the national economy. The proposed development is a tourism product expected to be added on Uganda's tourism packages.
Uganda Wildlife Authority	Uganda Wildlife Authority, (UWA) is Uganda's Government agency responsible for the management and protection of Wildlife in and outside protected areas. The agency is supervised by the Ministry of Tourism, Wildlife, and Antiquities. The Authority will also be responsible for the proposed development.
Uganda Tourism Board (UTB)	UTB is mandated to promote and market Uganda domestically, across the region, and internationally, promote quality assurance in tourist facilities through training, grading, and classification, promote tourism investment, support and act as liaison for the private sector in tourism development.



Stakeholder	Information requirement
Ministry of Gender, Labour and Social Development Department of Occupational Safety and Health Department of Gender and Women Affairs Department of Employment Services	The Ministry of Gender Labour and Social Development (MGLSD) has a mandate to empower communities to harness their potential through skills development, labour productivity, and cultural growth. It promotes issues of social protection, gender equality, equity, human rights, culture, decent work conditions, and empowerment for different groups such as women, children, unemployed youth, internally displaced persons, older persons, and persons with disabilities. The Department of Occupational Safety and Health within the MGLSD is responsible for administering the Occupational Safety and Health Act, of 2006, and carries out regular statutory inspections to ensure proper management of health and safety in the workplace.
Local Government stakeholders – Kabarole District Local Government Busoro Sub-county Lower Local Government	They provide vital baseline information about the socio-economic setup and other dynamics within the project area. Can be utilized as the contact persons in the project area Their structures at the lower local government can be utilized in the mobilization of communities for the good of the project. Can be used in the follow-up and supervision of community and non-technical programs Can come up with proposals on how to mitigate the impacts of the project.
Village leaders – LC I Chairpersons of the nearby village Sebitoli A	They provide vital information at the village level such as the number of households in the village etc. They are always used as mobilizers of community members Provide support to the project
Communities in the project area	They will be directly and indirectly affected by the project. Will provide casual labor during the construction phase. They are a good source of information on the trends and dynamics within the project area.
Tour operators within Kabarole district and Uganda	Will market the product hence need to involve them throughout

5.5.1 Stakeholder engagement methods and schedule

The primary methods employed in this Environmental and Social Impact Assessment (ESIA) included site visits and dialogue with key stakeholders, along with the analysis of secondary information. Physical visits were conducted to engage with selected stakeholders in Kabarole District and Kibale National Park (KNP), including tour operators, as well as the staff in KNP. Furthermore, additional consultations and visits took place in Kampala, involving discussions with key stakeholders in the Ministries, Departments, and Agencies (MDAs).

Stakeholder consultation and participation was done through the following means;

- Formal meetings were held with stakeholders at the different administrative levels. It involved sensitizing the leaders on the project including its background, objectives and location of project sites and the role of stakeholders.
- A community meeting was held in Sebitoli village and one on one discussions were also held with some community members and representatives of LC1 executive committee members.
- A Focused Group Discussion was also held with a women's group.

Public consultation and information disclosure are a continuous process throughout the design, implementation and evaluation of the Project.

The following stakeholders were engaged during the ESIA (Table 5-2).

Table 5-2: Stakeholders engaged during the ESIA

Category	Stakeholders	Stakeholders met	Date of meeting	Gender		Venue of meeting
				Male	Female	
National stakeholders	UWA (Kampala)	Justine Namara-Manager EIA and Oil Monitoring Joseph Muhereze-Concessions Officer	1/3/2024	1	1	UWA HQs Kampala
	UWA (Sunga station)	Edison Nuwamanya-Chief Warden	19/1/2024	2	1	Sunga offices
	MTWA	Lyazi Vivian-Commissioner Tourism Stephen Fred Okiror-PWO Mboijana James-Tourism Development Officer	29/2/2024	3	1	MTWA offices
	UTB	Sophie Kayongo Balijuka-Senior Product and Research Officer	19/2/2024		2	UTB Offices (Lugogo office)
	Occupational Safety and health	Ogwal Alex- PGHI/ ESIA Coordination	4/3/2024	1		OSH offices (MGLSD)

Category	Stakeholders	Stakeholders met	Date of meeting	Gender		Venue of meeting
Local Government	Kabarole District Local Government	- Balaba Swaibu-D/CAO - Kanyiginya Eunice-SEO - Naome Basoona-SOW - Baguma Deborah-Tourism Officer - Mirembe Cliff-District Labour Officer - Ruyonga Kenneth-Physical Planner	19/1/2024	5	4	District HQs
	Busoro Sub-county	Lilian Kajumba T-SAS	22/1/2024		2	Sub-county offices
Local Council and local community	Representatives of LC 1 executive with the local community in the following villages, Sebitoli	Tugume Nelson - Chairman LC 1	21/1/2024	36	30	Community member compound
	Sebitoli Women's Conservation and Cultural Group (CWCCG)	Birungi Margaret Mary- Chairperson	22/1/2024		7	Treasurer's home
	Tour Operators Association		21/9/2021	4	6	Online
	Tour Operator in Kabarole district	Ataryebwa Noah- Tour Guide	21/1/2024	2	1	Noah's Ark campsite



Pictorial of meeting at the district



Pictorial of meeting with the community of Sebitoli



Pictorial of meeting with CWCCG members

Figure 5-1: Pictorial taken during stakeholder engagement

5.5.2 Comments raised by stakeholders during the scoping phase

Presented in Table 5-3 below are comments raised by stakeholders during the scoping phase in 2021, these are guiding the ESIA team in impact analysis and mitigation measures identification and have to be put into consideration by the developer during project implementation. These have been re-included in this ESIA report because some stakeholders emphasized that the comments they raised during the scoping phase need to be considered and addressed by UWA.

Table 5-3: Comments raised at the scoping phase

Stakeholder	Issue	Action taken during the ESIA
National Stakeholders		
UWA-Head office Representatives	- This is a new development, so when consulting and engaging stakeholders, ensure that they understand what the project is about and how it will benefit the country. - Tour operators within Kabarole District should also be consulted as part of the Association of Uganda Tour Operators. - There could be community resource user groups who get products such as medicinal plants from the park, these too shall need to be engaged. - What studies does the team recommend for; Human-wildlife conflicts, revenue sharing, and community benefits from tourism? - Alternative locations indicating the criteria to consider them being alternatives should briefly be explained in the scoping report. - On the issue of risk assessment, the Canopy Walk will be raised in the trees, a risk assessment on likely impacts of the height of the canopy walk should be recommended in the detailed ESIA. Mitigation measures such as having tourists insured and posting safety signage should be proposed. - The team should also clearly indicate the project Area of Influence, so that proposed studies focus on some areas and not the whole KNP because it is quite expanse.	Adequate engagement and information presentation were done. Continuous engagement by UWA and other entities during project implementation is recommended. These were consulted at both scoping and ESIA phases. Information on these groups was captured in the socio-economic survey, were respondents said, the users collect resources from the park individually and not as a group. These studies were proposed in the scoping report and have formed the scope of the ESIA phase. Alternatives were presented in the scoping report and have been further detailed in this ESIS. A risk assessment has been undertaken chapter 8 of this report. For safety concerns, measures have been presented in section 7.11. The project area of influence was indicated in the scoping report and so activities concentrated in Sebitoli area during the ESIA. Key issues were identified and addressed in both phases.
		162

Stakeholder	Issue	Action taken during the ESIA
	The National Environment (Environment and Social Assessment) Regulations, 2020 and National Environment Act, 2019 indicate key issues that need to be addressed, these need to be reflected in this report.	
Ministry of Tourism, Wildlife and Antiquities (MTWA)	- How many people are envisaged shall be on the canopy walkway per visit? What is the plan to control overload? What is the maximum load of the canopy if for instance, 5 elephants walked on the canopy, would it hold? - What is the lifecycle of the proposed materials? When should the client plan replacement, repair, and maintenance? Generally, materials should be eco-friendly. - How many trees will be cut down? - How will materials be transferred to the site? - How will waste spill overs be managed e.g., metals and concrete during the construction of the walkway? - A materials lifespan analysis should be undertaken before project implementation. This will help determine how long it will take before any parts of the canopy walk are replaced/repared. - Does the study team plan to provide an analysis of the selected materials to ensure that there are no side effects to the animals? - Elephants in the area are sensitive to foreign structures like the one being proposed. What is the guarantee that the proposed canopy walkway will not affect the elephants' behavior or that the elephants will not pull the structure down? - A decision of using G.I. and painting steel should be assessed to avoid using paints or finishes that could affect wildlife, birds, and other species in the park. - What is the justification for the choice of materials? Given that the park has alien species that could be affected by the material used? - What are the foreseeable risks due to the development of the proposed canopy walk? - To what extent does the design ensure the safety of people on the canopy walkway, given the rampant suicide issues in the country?	The design proposed can with stand weight of an elephant (section 2.3 and 2.8). Proposed materials shall withstand effects of weather for a century before requiring change (section 2.4, 2.5 and 2.6). The design (python form) has been made in such a way that tree cutting will be avoided. Steel materials will be fabricated off site and transported to the ranger camp, concrete mixing for base columns will be done at the ranger's camp then transported by wheel barrows to site. A crane will also be used during construction. Proposed materials shall withstand effects of weather for a century before requiring change (section 2.4, 2.5 and 2.6) and are suitable for the ecosystem. Presented in section 2.6. Chapter 7 identifies and analyses likely risks due to development of the canopy walk, mitigation measures have also been presented.

Stakeholder	Issue	Action taken during the ESIA
	- How does the proposed design cater to the movement of the animals? Does it interfere with the animal pattern of movement and interaction with the different species? - What is your plan if the animals run away from the Sebitoli sector because of the proposed canopy walkway? - How is the issue of privacy considered in the design of the canopy walkway? Some tourists need privacy. - Why the 16m canopy walkway if the majority of the trees are beyond 16 meters in height, will the design serve the purpose? - The private operators in the park and CSOs should be consulted about the proposed development to determine if it's a relevant addition, maybe tourists might prefer the forest to remain pristine, such as Birders-Nature-Uganda, Academicians-Makerere University. - Where possible the local community should be offered employment opportunities. - Waste should be adequately handled, and good housekeeping maintained. - Ambient noise levels shall be ascertained before project implementation so that they are maintained during construction. - The project will spur the development of nearby village. - Overall, if the economic estimates during this feasibility study make sense, this will be a good project to replicate elsewhere in the country.	UWA shall put in place guidelines for use of the canopy walk for sustainability. Height consideration has been explained in section 2.7. Engagements should continue throughout project implementation. UWA shall put in place guidelines for use of the canopy walk for sustainability. The economic/financial, environmental and social assessment indicated that project to be viable.
Association of Uganda Tour Operators (AUTO)	- What is the duration of construction, considering construction might affect the chimpanzee trekking activity? - The proposed project is a good addition to the tourism sector. - A longer canopy walkway might be more attractive to tourists compared to a shorter one with many lookout towers. Tourists will enjoy spending time walking along the walkway. - Will the walks along the walkway be guided or done independently? Perhaps it should be packaged to suit different preferences i.e., guided and not guided.	A detailed project implementation schedule will be developed by UWA and will aim to avoid disturbance to tourism activities in the area. Different design alternatives were assessed by the design and other teams, and a more suitable option (distance, height and no of watch towers) was selected. UWA shall put in place guidelines for use of the canopy walk for sustainability.

Stakeholder	Issue	Action taken during the ESIA
UTB	- Issues of concern would be; - There is a need to ensure the safety of tourists, there should be no threat of injuries to tourists. - The proposal to use beehives to keep elephants away might endanger tourists, so this needs to be thought of and adequately investigated. - Accessibility to the Canopy walkway should be adequately planned, i.e., considering PWDs, because they also need to enjoy the proposed experience. - Maintenance of the facility should be annual; this will help identify weak areas before they become hazardous. - The feasibility study being undertaken is good, but how will information be presented for potential tourists to know about the new development? It needs to be packaged properly. - Tour operators individually should be consulted because some don't belong to any association yet they have vast experience and knowledge about tour packages. - There could be a threat of lightning striking since the facility will be raised in tree canopies, this should be planned so that tourists are safe. - Overall, communities shall benefit beyond the revenue shared by UWA. They can participate in entertaining visitors and acting as guides educating tourists about local experiences giving local names of trees and animals. - It should be noted that biodiversity in KNP is the main attraction (chimpanzees and elephants as well as tree and bird species), so the concern would be that the animals may change routes or even leave the park because of the new development. This is a concern that can affect the tourism experience, so the feasibility study team must propose adequate mitigation measures. The canopy walkway should improve the experience but not take away what is being enjoyed at the moment.	UWA shall put in place guidelines for use of the canopy walk for sustainability. Monitoring will be done regularly to identify areas of weakness, however materials proposed were selected because of their resilience to effects of weather. Different stakeholders will perform their roles in marketing the product. For sampling purposes, AUTO members were consulted and individual tour operators in Kabarole represented those not belonging to associations. This has been taken into consideration during materials selection. A number of proposals were raised by the local community, all stakeholders have to play a role in ensuring local community benefit. UWA shall put in place guidelines for use of the canopy walk for sustainability.

Stakeholder	Issue	Action taken during the ESIA
	Monitoring of the project by relevant stakeholders will be crucial to ensure that intended benefits are achieved and that negative impacts are mitigated.	
UWA-Kanyanchu station	- Sebitoli has few visitors, who come for different tour packages mostly nature walks and chimpanzee trekking. Generally, benefits at the moment for the community are minimal. - The community in Sebitoli village has not yet established accommodation facilities for tourists, they need to be encouraged to tap into this venture. - Human-wildlife conflicts arise as a result of animal raids of community gardens. However, UWA working with different stakeholders has implemented several initiatives/measures to manage/control human-wildlife conflicts. UWA using the percentage of royalties received per sub-county helps affected villages establish trenches that act as buffers to prevent elephants from going to peoples' gardens. Community groups have also been given beehives to help keep wild animals away from their farms. - Despite, the current human-wildlife conflicts, the proposed Canopy walk, will improve relations with the community. It is anticipated that the community will engage in some tourism activities and stop relying on agriculture only. The community will develop accommodation facilities, and engage in tour guiding and making crafts. - The community should not worry that an increase in the number of tourists will worsen the problem of human-wildlife conflicts because the number of visitors doesn't determine raids by wildlife. Rather, the higher the revenues from tourism, the more animal raid measures will be strengthened. It's anticipated that the community will even become more tourism business-oriented.	All stakeholders have to play a role in ensuring local community benefit. The human-wildlife conflict has been discussed in section 4.4.7 and strengthening measures proposed by different stakeholders. All stakeholders have to play a role in ensuring local community benefit.
Local Government officials		
Chief Administrative Officer	There is a need for the community to gain from the project.	All stakeholders have to play a role in ensuring local community benefit.
District Civil Engineer	Conduct the Geotechnical surveys and endeavour to involve the district to have an appreciation of the structural drawings for district input and review before final submission.	Plans shall be submitted for approval by the LG.

Stakeholder	Issue	Action taken during the ESIA
	The project should be designed in such a way that it does not disturb the status quo of the park by bringing about the migration of the animals.	
District Natural Resources Officer	- Trees are likely to be cut during construction, thus mitigation measures to offset the affected trees need to be planned for. Threatened tree species in the project area should also be assessed and protected during construction. - Any imported materials into the park should not be left after construction. - Activities like welding should not be done in the park to minimize the noise and unnecessary commotion generated in the park. Where possible materials should only be assembled. - Some structures should be protected by the use of obnoxious smells and digging of trenches around them. Trenches can be suitable and they should be 4m by 4m so that they are visible enough to prevent elephants from falling in.	The proposed design is avoiding tree cutting. Steel materials will be fabricated off site and transported to the ranger camp, concrete mixing for base columns will be done at the ranger's camp then transported by wheel barrows to site. A crane will also be used during construction.
District Community Development Officer	- The community will benefit from the increase in tourism numbers as a result of constructing the Canopy Walk. - Tree cutting should be minimized. - The project should ensure that the communities' benefit from the project. They should be considered for employment opportunities.	All stakeholders have to play a role in ensuring local community benefit. The proposed design is avoiding tree cutting.
District Planner	Where possible noise in the park should be minimized, i.e., machine usage should be limited.	Manual labor has been proposed for the most part during construction.
District Tourism Officer	- Human-wildlife conflicts in the area, are increasing, thus designs should minimize the destruction of animal habitat, which might end up pushing the animals further in the community. The relationship between UWA and the local community needs to be improved. - Social, ecological, and economic benefits have to be considered. - The major concern during project implementation should be ecosystem conservation. - UWA should allow the community to decide on the projects to be implemented with the royalties received. - KNP tourism revenue is not as high as that of other parks, so it's hoped that the proposed project will lead to increase in the number of tourists visiting thus higher revenue.	The proposed design is avoiding ecosystem destruction/change. All stakeholders have to play a role in ensuring local community benefit. A review of the law in this case is required.

Stakeholder	Issue	Action taken during the ESIA
District Environment Officer	- Environmental considerations/mitigation measures should be put in place for reduced vegetation clearance, noise, and air pollution. - Wildlife is attacking communities. UWA should ensure the safety of tourists. - Ensure that local communities are engaged extensively about the project proposed. - Please involve and engage local unskilled and skilled labour as much as possible and also use local materials from within the communities as opposed to ferrying from distant places.	These have been proposed in chapter 7 UWA shall put in place guidelines for use of the canopy walk for sustainability. All stakeholders have to play a role in ensuring local community benefit.
Busoro Sub-County Officials	- Beautification of the park is welcome but there should be tangible benefits for the people. - The Sub-County expects revenue will increase hence improved service delivery for the community. - With the death of locals from wildlife attacks, it is hoped the project will engage the community for a positive attitude and a harmonious coexistence with the park - The migration of birds and other animals is one concern for which mitigation measures need to be in place. - The local community should be offered employment opportunities. - Measures should be considered to ensure that trees along the canopy walk are not cut down to preserve the tree species in the park. Effects on vegetation during construction should be minimal. - UWA doesn't compensate people when their crops get destroyed by wildlife. They have dug trenches but the community needs direct compensation. We hope the proposed project will highlight these matters to UWA. - The project will encourage local tourism and increase international tourism numbers. - If tourism numbers increase, the community will benefit when they offer accommodation to tourists and produce art and craft products. - The Canopy walk will add beauty to the park. - By purchasing local products and construction materials for the canopy walk, locals will gain income.	All stakeholders have to play a role in ensuring local community benefit. Engagements shall continue throughout project implementation. The proposed design is avoiding ecosystem destruction/change. All stakeholders have to play a role in ensuring local community benefit.
Kabarole Tours	The community will benefit if they put up accommodation facilities, restaurants, and crafts shops.	

Stakeholder	Issue	Action taken during the ESIA
	- There will be economic multiplier effects from the increase in tourism numbers. - The Canopy walk will be a new attraction in the area, it's unique so it will be beneficial to the area. - The community doesn't feel like they are benefiting from the park yet their gardens are affected by elephants and chimpanzees, they also feel they don't get compensated directly. - The policy of putting up social infrastructure using the 20% revenue from tourism should be reviewed. Communities need to be further sensitized about how to benefit. - The project will ease pressure on chimpanzees since there will be other attractions. - No negative impacts are anticipated especially if construction minimizes tree cutting.	All stakeholders have to play a role in ensuring local community benefit. The proposed design is avoiding ecosystem destruction/change.

5.5.3 Comments raised by stakeholders during ESIA

Table 5-4 below presents concerns/comments and recommendations raised by stakeholders engaged during ESIA.

Table 5-4: Comments and concerns raised by various stakeholders

Stakeholder	Comment/concern	Response/proposed action
Uganda Tourism Board	• Labour during construction should be from the immediate village. • KNP is a primate park with endangered species, the anticipated increase in tourist figures could affect Primates' behavior hence making them move away from where they currently range. Visitors to the canopy will thus need to be managed. • To control the easy spread of diseases from humans to animals and vice versa, the use of masks by tourists should be recommended. • For safety purposes, there should be rails on the sides and these should be safe for all sizes and ages. • Depending on the price, the product might become popular which might lead to high numbers of tourists, which might also lead to disturbance of tourists who do chimpanzee trekking. It will thus be necessary to adequately plan the price of this product. • UWA could consider making the canopy walk a 500m one, going beyond 500m might be too much yet there is not much biodiversity to be seen. • Plan for exit points as a safety measure. • Marketing of the product will be done by different stakeholders including all tourism government agencies and tour operators. • UWA should zone the forest/park so that it is clear which tourism activities are found where, that way no activity will be affected. • The product becoming massive will affect the ecosystem, thus a need for proper planning and project operation. To ensure product sustainability, the government/UWA will have to ensure adequate marketing, maintenance, and community involvement, and ensure that wildlife is protected. In addition, there will be a need to collect statistics from visitors to the canopy, the product should be cheaper than chimpanzee trekking but not too cheap which could lead to very high numbers of tourists and there should be age restrictions for safety purposes.	For local community benefits, this has been proposed in the enhancement measures. Mitigation measures against likely change in behavior of animals and effects have been proposed. Safety rails have been considered in the design. Mitigation measures against likely change in behavior of animals and effects have been proposed. Safety measures have been proposed. Zoning of the park will be considered. UWA to ensure that all comments are put into consideration.

Stakeholder	Comment/concern	Response/proposed action
Ministry of Tourism, Wildlife and Antiquities	• The design should be that the facility structures blend well with the forest to avoid animals getting aggressive because of unfamiliar sites. • Isn't the proposed 450m too short? • The product shouldn't only target foreign tourists, domestic tourists should also be planned for. • The value of the canopy walk should be assessed against the price to be set as well as tourist enjoyment so that the tourist will not feel cheated. Considering that above the canopy, there might not be much (wildlife) to see. • The canopy walk should be integrated with other tourist products/activities so that tourists don't only go for the canopy walk but rather have other enjoyments like restaurants and scenic sites to view (Rivers and valleys, etc). The local community could also be helped to develop a community ecotourism package which should also be marketed as part of activities within the Sebitoli sector. • The ESIA team should refer to the scoping phase comments and integrate them into the ESIS. • UWA should note that value for clients' money is crucial, just walking along the canopy and trees will not be enough, because seeing animals like elephants and chimpanzees while up in the canopy might be impossible. Tourists need to enjoy themselves. A reasonably engaging tourist package needs to be planned so that tourists have maximum enjoyment. • UWA should also consider incorporating a zip line or a rope swing and any products that will add to the tourists' excitement/adventure/challenge so that UWA (revenue) and the tourists (value for money and enjoyment) maximize benefits. • The ESIA team should ensure that alternative sites are adequately assessed because eliminated sites could have given a better view and enjoyment for the tourists. So, reasons for eliminating different sites should be presented.	The design has put this into consideration. The other alternative was 400m, the selected distance has been 450m. Domestic tourists are also being considered and price packages will be planned for them as well. There is a proposal to revamp the Sebitoli area by adding stopover point with restaurant, curio shop/mini museum/information center/ craft shop. All these will add onto the tourist enjoyment. Reference to scoping phase comments has been made (Table 10 above). The development of additional products by UWA/government for KNP will be a continuous process. The alternatives chapter has been adequately discussed. UWA should endeavor to see that the community benefits, perhaps by identifying ways of helping them start up eco-tourism businesses. UWA should develop an emergency response plan for implementation during project operation.

Stakeholder	Comment/concern	Response/proposed action
	- UWA should endeavor to see that the community benefits, perhaps by identifying ways of helping them start up eco-tourism businesses. - For safety purposes, UWA should ensure that there is a safety plan in place, to protect both animals and humans, interaction with animals should be very minimal, and escape routes thus should be planned. - Is it possible for UWA to consult tourists before the project is implemented?	UWA should consider this.
UWA- Kampala office	- The ESIA team should ensure that the project description chapter is adequately presented, clearly indicating animals to be seen by tourists, if its only monkeys and birds this should be explained. The description should show the interesting wildlife that tourists will see, if chances of seeing elephants are none existent this should be indicated. In addition, noise from tourists may also make elephants move further away from the area. - The ESIA team should adequately review the feasibility study report to pick out reasons why the proposed site was selected in the end. So, the ESIS alternatives section should be well presented. - Safety measures should also be presented since the project involves being at heights and it's in a wildlife zone. - There is a potential impact of the walkway developing molds which can make the surface slippery causing safety concerns. - The ESIA team should benchmark (through literature review) the Nyungwe canopy walk in Rwanda and propose measures to maximize tourist satisfaction and safety measures. - The ESIA team should also propose mitigation measures against wildlife migration as a result of an increase in tourism activities in the Sebitoli area. - To ensure that tourists enjoy the visit to Sebitoli, in addition to installing the Canopy walk, UWA plans to propose the construction of a stopover point with some of the following facilities; a restaurant, mini-museum/information center, curio/crafts shop, so	The project description chapter has been adequately discussed. The alternatives chapter has been adequately discussed. The mitigation measure proposed against this threat is the use of durable material (treated wood) and regular cleaning to remove molds. Literature about different aspects including canopy walks worldwide has been reviewed. Mitigation measures against effects to wildlife have been proposed. This provides response to tourist satisfaction/package for the Sebitoli area. Marketing and packaging for the product should adequately planned.

Stakeholder	Comment/concern	Response/proposed action
	that tourists go to Sebitoli for more than the canopy walk. The local community will also be encouraged to formulate groups to showcase local dances and culture as part of the tourist experience. • During the development/conceptualization of the canopy walk project, it was proposed that since the Sebitoli area is near Fort Portal City, tourists should have an alternative to Kanyanchu (which is relatively far from Fort Portal) in case they have limited time before continuing to Kasese or Kampala. • The product aims to increase domestic tourism, though to regulate visitor numbers, the cost of the product might eliminate some domestic tourists. • There is also potential for UWA to introduce a zipline or swing to make the canopy site more interesting hence increasing tourists' satisfaction. • Communities could be sensitized to formulate groups and offer products to the tourists at the facility. • UWA may also consider improving the Sebitoli campsite so that tourist visitors there increase hence bringing in more revenue and benefits to the locals (through community walks/visits).	Regulation of numbers should be done to minimize disturbance of the ecosystem.
OSH- MGLSD	• The product sounds interesting, so it's welcome, however, health and safety measures have to be planned for. • There are likely to be concerns about fall hazards, considering the walkway will be raised at a height of up to 16m, so protection measures during construction and operation should be in place. For instance, during the construction phase, support structures/equipment like cranes to carry materials and workers should be used. • Cranes are statutory equipment that will require inspection by the OSH department. • Measures to protect tourists against slipping and falling on the timber walkway should be in place. • It's risky not to cover the top of the canopy because animals might attack tourists on the walkway, so tourists should be protected against wildlife.	Safety measures during the different phases have been proposed. UWA should adhere to the different recommendations.

Stakeholder	Comment/concern	Response/proposed action
	- According to guidelines and regulations, all work sites must undertake a risk assessment, plan for regular inspections, regular maintenance, and regular monitoring. The monitoring will enable UWA to halt canopy visits in case the need arises. In addition, it is recommended that UWA provides training to walkway workers and ensure that the walkway is clear of trip and fall hazards and has enough natural lighting. Workers should also be given adequate breaks. - UWA should develop an Emergency Response Plan, indicating a first aid plan, procedures for evacuation, referral to medical facility, and the program of training of workers in emergency preparedness. - During construction and operation habitat destruction should be minimized, and the ecosystem should be protected. - Considering that wood to be used shall be treated, how will potential pollution of water sources be mitigated? Storm water should be directed away from area water points. - To mitigate noise emissions, construction equipment should be serviced and regularly checked, and noisy equipment shouldn't be used. - Economically, will the local community benefit or they will lose, these need to be weighed so that its more benefits than losses. UWA should also consider CSR programs to implement in the area. - To minimize disturbance to wildlife, no work should be done at night. - Efforts should be taken to restore the canopy site to near natural habitat. The construction contractor should minimize impacts on nature, less noise, and air pollution. - The ESIA team should ensure that all stakeholders are engaged. - The construction workplace should be registered with the OSH department. - Welfare services should be provided both during construction and operation, including eating places, drinking water, sanitary facilities, and changing rooms.	An Emergency Response Plan has been proposed as part of safety measures. Measures against water pollution have been proposed. The ESIA team has assessed the different impacts and mitigation measures proposed. UWA should follow up on requirements from different lead agencies during project implementation. The project has been designed in such a way that tourists will prepare themselves at the campsite before going for the 450m walk. All proposed materials were assessed for suitability during the feasibility study.

Stakeholder	Comment/concern	Response/proposed action
	● Observe the Employment Act guidelines including recruitment of locals, no child labor, and expatriates should have permits, and providing workers with appointment letters with clear terms, etc. ● 450m is a short distance, but what will happen in case a tourist/tour guide has an emergency to use a sanitary facility? ● Check/assess the health status of workers throughout project implementation. ● UWA should ensure that the wood treated for the walkway is suitable for the forest ecosystem. The risk assessment will also guide in identifying the likely risks from the treated wood materials. ● Community involvement should be deliberate.	
Kabarole District Local Government	● A major issue of concern for the community at the moment is animal raids, if that is addressed, then the community has no problem with the Park or any proposed activity. ● After the establishment of the canopy walk, the Sebitoli sector/area will also end up being active as Kanyanchu hence increasing revenue. ● The design should consider closing the canopy top with a mesh so that animals like monkeys and chimpanzees don't walk on the walkway. ● All safety concerns should be identified and management measures planned, UWA should ensure that management of all risks is planned. ● The medical health of construction teams should be checked before the commencement of work since the ecosystem is fragile. ● Proper waste management (sanitary and other waste-food and packaging) should be done, both during construction and operation. ● Security measures such as having security personnel and cameras should be planned so that canopy materials are protected against vandalism. The community should also be sensitized to ensure that they appreciate the project. ● The handrail should be adequate for children.	UWA should explore alternative community benefits/support aside from the 20% from gate collections. Different stakeholders should help the local community maximize the benefits from increased tourism numbers. The design has considered covering the canopy walk-top. All safety concerns have been assessed and management measures proposed for implementation by UWA. Proper waste management has been proposed. Recommendations should be considered by UWA.

Stakeholder	Comment/concern	Response/proposed action
	• The district physical planning office should be involved, by reviewing and approving architectural drawings, to ensure that plans are in tandem with the district physical plan. UWA should seek the approval of the physical planning committee. • The construction contractor should use local labor, to ensure it is easy to follow up on workers in case there are problems. • During project implementation all social safeguards should be followed, using MGLSD guidelines. It's a requirement in the guidelines that for all government projects social safeguards have to be mainstreamed. • How will Kabarole district locals benefit financially? Will people be allowed to supply materials, will they be employed? UWA and the construction contractor should work with the district labor office following World Bank and MoGLSD guidelines. • The construction contractor should have measures in place to manage pollution. • A restoration plan for material sources should be in place. • UWA should plan for the anticipated weight versus the number of tourists to ensure that the canopy is strong enough. • What plans are in place to manage sanitary waste while atop the canopy? • The design should have an escape route, in case the need arises for tourists and workers during project implementation. • During the maintenance or replacement phase, waste should be managed adequately. • Will the current structures (such as sanitary facilities, and energy) at Sebitoli sector be adequate to accommodate// use by construction teams and during operation? • Major incidents to Park Rangers are snake bites and pricks from thorns and tree branches.	Workers shall be hired following national policies, laws and guidelines. Social safeguards should be in place. Pollution control measures have been proposed for implementation. The design has catered for the weight that the walk way will be able to sustain. UWA should ensure visits are regulated to avoid exceeding the planned weight per planned timeframe. The current facilities should be improved to accommodate the tourist numbers.

Stakeholder	Comment/concern	Response/proposed action
UWA – Sunga office	- It is hoped that the wood to be used shall be treated wood, nature-based naturally blending, and durable, so that wildlife doesn't see much change in the environment. - Rails on the canopy should be planned so that people don't flip over easily and injure themselves. The rails will also offer protection and can be used for tourists to hold on. - Security for tourists needs to be planned because primates especially chimpanzees and monkeys are generally inquisitive like humans. They might get used to the tourists on the canopy walk and also start playing/hanging on it. A ring/net above the canopy can also be planned. - The color of the structures will determine if elephants will break down the poles, forest blending colors should be used. - Currently, there are no other planned/given concessions for the Sebitoli area, however, any UWA/Government developments will be in tandem with the ecosystem. - Primates can exchange diseases with humans and considering the number of animals and humans that shall visit the canopy walk, monitoring of animals and research by rangers will be crucial. In addition, it should be planned that all visitors' biodata is kept on record.	Blending with the ecosystem has been proposed in the design. Rubber rails have been proposed. Safety measures and designs have been proposed. Nature blending colors have been proposed in the design. All visitors' biodata should be kept on record, during operation.
Crater Lakes Tours Uganda (Tour Company)	- The proposed development/tourism product is a welcome addition to those available in Kibale/Kabarole and Uganda at large, the tourists will appreciate the addition. - Currently tour guiding companies in Kabarole have no Association/Group, however, this being a new product, the different operators will market it on their platforms as an addition to already existing activities (chimpanzee trekking, bird watching, and nature walks). - More products in Kabarole district implies more tourist clients hence a good reputation for the tour operators.	UWA should work with Tour operators to maximize benefits from the canopy walk and planned package. Mitigation measures have been proposed for the identified impacts.

Stakeholder	Comment/concern	Response/proposed action
	• The increase in tourist numbers also implies improvement for local benefits through employment and purchase of local farm products. • Fears; • In case the canopy walk product is priced expensively, this will affect the amount of revenue UWA and the operators (income) will get. Consideration should be made for the product to be between 50-70 dollars. • It is anticipated that during construction some trees will be cut down, which will lead to loss of habitats for birds and other biodiversity. • The amount of time spent on the canopy walkway should be planned so that it's just adequate (not too long yet long enough for tourists to see expected animals). • Environmental disturbances and pollution should be restricted, such as extreme noise levels, and plastics should be managed. • Bookings should be timed so that tourist groups don't collide or be too many at the canopy walk at the same time. • The 450m walkway is not so long, so marketing of this product will need to be adequate and tourists shouldn't bump into each other. • UWA packing should also consider tour operators because the operators bring clients but can't afford the same amount as the tourists. So, a lowered price/fee for tour operators should be considered. • Local community should develop eco-tourism products which they can sell to tourists.	
Sebitoli village local community	• Will the local community have the opportunity to sell different products to the tourists that will come for the canopy walk? • Construction contractors should offer local community jobs for example drivers, and porters as well as cooking for construction workers. • Will the local community be allowed to take tourists to the canopy walk? • Will the local community be allowed to visit the canopy walk?	The local community was advised to form tour guide groups and work with UWA. The local community was advised to develop other ecotourism products that UWA would sell to tourists who will come for the canopy walk product.

Stakeholder	Comment/concern	Response/proposed action
	• In case manual labor is to be used and not machinery, then the local community should be considered. • Advantages are more than the disadvantages. • Won't baboons jump on the walkway? • The canopy walk might not directly affect the local community negatively, however, revenue from the increase in tourist numbers should be used to compensate those who were affected by animal raids (crops and lives). • The locals should be allowed in the park on selected days to pick medicinal tree species. • Compensation for those who were affected by animal raids needs to be affected.	Local communities are domestic tourists and will be treated as such, in addition to specific programs that KNP will arrange. Likely impacts and disturbances have been identified and mitigation measures proposed.
Sebitoli Women Cultural and Conservation Group	• UWA gave the group 10 beehives from which bee products have been extracted but we are still trying to get trainers to help us diversify products from the bees. • Group members can also make paper handbags, handicrafts and other products though we are limited in creating designs. • The group lacks start-up capital for some of the tourism products they desire to produce. • The group has a plan to put energy into different tourism products such as dance drama and cultural presentations since there are many tribes in the area. The group is known by UWA hence the group will request UWA to market their group products. • For the group to benefit from the increase in tourism numbers, there is need for members to be trained in the development of different tourism products.	Members of the group and other groups in the area were advised to work with different stakeholders to benefit from tourists in the area.
Busoro Sub-county	• The sub-county can't do much on the issue of wildlife conflicts, it can only advise the community after receiving the % from UWA revenue collections. • Continued sensitization of the community about tourism benefits should be done so that they appreciate the tourism sector. • The local community should be involved during project implementation.	The Sub-county should be called on for involvement in community tourism programs.
Kaswa Police Post	• Sebitoli village recorded no major crimes in November and December 2023. • What are normally recorded are fights among drunkards. Others are those without IDs and people loitering.	Mitigation measures against likely security threats have been discussed.

Stakeholder	Comment/concern	Response/proposed action
	• Cases also reported were in the National Park where cameras for researchers were stolen possibly by poachers. • Accommodation for construction workers might not be adequate, Kaswa Trading Center should be considered for accommodation. Kaswa also has better security.	

Association of Uganda
Tour Operators Ltd

Sept 23rd, 2021

The Architect,
New Plan Ltd,
Kampala, Uganda.



Dear Sir,

RESPONSES REGARDING THE KIBAALE CANOPY WALKWAY

I bring you greetings from the Association of Uganda Tour Operators (AUTO), Uganda's leading tourism trade association of professional tour companies.

Below are responses from AUTO membership regarding the construction of the Kibaale Canopy Walkway:

- a) We believe the new activity will boost tourism by diversifying on the activities to be done around Kibale Forest NP and widening visitors' experiences. This will in turn fetch more revenue.
- b) It may benefit other areas indirectly. For example, the human labour that will work on the construction of this project, are likely to be from different parts of the country, hence benefitting their households and communities.
- c) Domestic tourists from different areas will get an opportunity to have an activity that has not been in place in this country before.
- d) I do not think that there are major concerns on biodiversity.
- e) Clients for Rwanda tours have always loved the Nyungwe canopy walk and recommended it; we believe this will be a great project for Kibaale as well.
- f) The project implementors need to get right people for the job to make sure, that the materials used are of quality to avoid future tragedies since this is an activity that involves high safety risks.

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- g) Thorough ecological impact assessment needs to be done before the project commences to make sure the impact on the natural habitat is not negative.
- h) Pricing should also be done carefully. In order to attract and popularise the new project, a fair price needs to be put in place such that it doesn't discourage people.
- i) New Plan Ltd should share images about the actual location.
- j) Interaction between humans and chimps would not be a good situation – how would this be avoided?

Kind regards,



Nancy Okwong
Public Relations Officer (PRO)

5.5.3.1 Comments most raised by all the stakeholders

- Depending on the price, the product might become popular which might lead to high numbers of tourists, which might also lead to disturbance of tourists who do chimpanzee trekking. It will thus be necessary to adequately plan the price of this product.
- The design should be that the facility structures blend well with the forest to avoid animals getting aggressive because of unfamiliar sites.
- The canopy walk should be integrated with other tourist products/activities so that tourists don't only go for the canopy walk but rather have other enjoyments like restaurants and scenic sites to view (Rivers and valleys, etc). The local community could also be helped to develop a community ecotourism package which should also be marketed as part of activities within the Sebitoli sector.
- UWA should endeavor to see that the community benefits, perhaps by identifying ways of helping them start up eco-tourism businesses.
- The ESIA team should also propose mitigation measures against wildlife migration as a result of an increase in tourism activities in the Sebitoli area.
- UWA should develop an Emergency Response Plan, indicating a first aid plan, procedures for evacuation, referral to medical facility, and the program of training of workers in emergency preparedness.
- Considering that wood to be used shall be treated, how will potential pollution of water sources be mitigated? Storm water should be directed away from area water points.
- A major issue of concern for the community at the moment is animal raids, if that is addressed, then the community has no problem with the Park or any proposed activity.
- The design should consider closing the canopy top with a mesh so that animals like monkeys and chimpanzees don't walk on the walkway.
- In case manual labour is to be used and not machinery, then the local community should be considered.
- The canopy walk might not directly affect the local community positively, however, revenue from the increase in tourist numbers should be used to compensate those who were affected by animal raids (crops and lives).
- Continued sensitization of the community about tourism benefits should be done so that they appreciate the tourism sector.
- Local community should develop eco-tourism products which they can sell to tourists.

6 PROJECT ALTERNATIVES

A number of alternatives for the Canopy Walk project in the KNP were identified during the project design an. These alternatives are meant to provide a comprehensive understanding of potential impacts and assess the feasibility of the proposed project. Below is a screened list of alternatives that were considered during the ESIA:

6.1 No project alternative

In the ESIA procedure, it's crucial to explore various alternatives or options that can meet the project's goals. Equally important is evaluating the scenario where the project doesn't proceed—the "no project" alternative. Each alternative requires environmental assessment as they are expected to have distinct impacts. While different project alternatives possess unique features, they can generally fit into one or a blend of the subsequent categories.

Choosing the no-project alternative involves maintaining the current status in the Sebitoli northern zone of KNP without introducing additional Canopy Walk development. Opting for this alternative would entail avoiding the negative impacts linked to Canopy Walk development in KNP but also foregoing the positive benefits, such as increased tourist numbers, revenue, improved services, enhanced employment opportunities, and economies of scale associated with the development. UWA, UTB, MTWA, and various government policies advocate for the creation of higher-quality facilities to attract affluent tourists. Therefore, selecting the no-project alternative doesn't imply a failure to implement these policies but rather their implementation in alternative locations.

Various stakeholders expressed interest to have such tourism product in place, although they expressed their concerns mainly on hazard, security and safety as was recorded in the public and one on one engagement. However, for UWA, the no project alternative would mean missing the site for CW-in-KNP and its related benefits. With this option, the anticipated impacts resulting from development of this project would be avoided. However, the benefits expected from the project as mentioned in section 7.1.2 of this ESIS would not be realized.

6.2 Action option

This option involves implementation of the proposed canopy walk. With this option, the benefits expected from the project such as direct employment opportunities, business opportunities, increase revenue due to increase in tourism attractions and tourists, improvement in local livelihoods, and learning and research opportunities for students and researchers would be realized. However, mitigation measures have been proposed for anticipated impacts in this ESIA report.

6.3 Site Location Alternatives

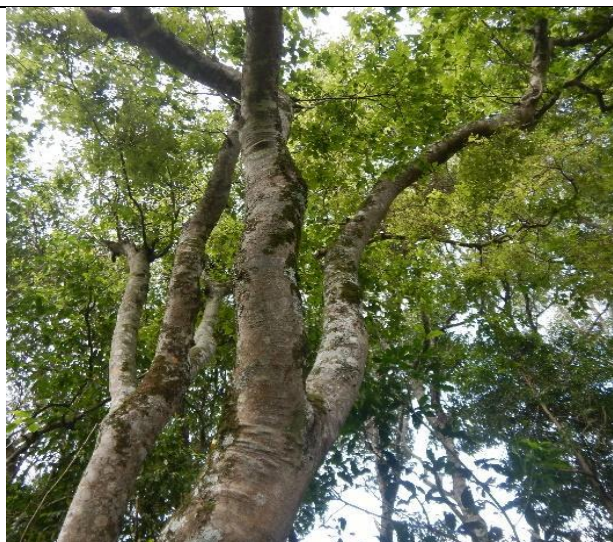
A reconnaissance/site visit was undertaken by the ESIA team together with the Design team and the Client (UWA) on 7th and 8th April 2021, followed by scoping study in August 2021. The team carried out preliminary walks in the park taking into consideration several alternative routes for the canopy walk. Several observations were made during the walks and the findings will guide and inform the methodologies for the subsequent phases. An analysis of the five proposed location options was undertaken to facilitate the canopy walk route analysis and selection.

The alternative canopy walk routes are briefly described below:

6.3.1 Description of the canopy walk route options

6.3.1.1 Option 1 (300m long and without a tower)

Starting at the existing access road leading to the administration facilities of Sebitoli Visitors Centre, and following an existing tourist trail within Kibale Forest, and a short walk of 120m, this 300m route starts from a raised point (approx. 12m high), and then gently sloping, and passing besides a two stance pit latrine to the left, and a campsite to the right hand side (Figure 6-1), the route run through various trees, ranging from medium to large mature and strong trees with a good canopy cover, that would have a very good view of the park. Common trees included *Prunus africana* (Red stinkwood- Vulnerable as per IUCN Red list of 2021), *Albizia* spp. Within this option, several mammal species including the Black and White Colobus, and Red Colobus were encountered.



Tree Canopy along option 1



Medium sized tree along option 1



Figure 6-1: Features within option 1 site

6.3.1.2 Option 2 (300m long, and with a tower)

This option follows the same route as option 1. However, a 27m tall lookout tower is the added feature. It starts at the same raised point (UTM 36 N 0208936, 0071485) where option 1 starts, and has similar vegetation up to a low point at (UTM 36N 0208886, 0071407).

The lookout tower is connected at 96m from the starting point. Visitors can choose to ascend two more levels to a top outlook platform 24 metres above the forest floor. This top platform has a high-tech UV resistant stretch fabric cover, offering rain protection to this level and to the two platforms below. The plan layout of these platforms is oval shaped, with a sculptural spiral stair linking the levels. The tower is a stand-alone observation tower on a central column structure.

6.3.1.3 Option 3 (450m long and without a tower)

Option 3 is as seen in Figure 6-3 below) is shaped in form of a loop, giving tourists amazing experience of Kibale Forest. Common trees species along this loop were *Prunus africana* (Globally Vulnerable (IUCN 2021) and *Albizia grandibracteata*. *Ficus* sp and *Techlia nobilis* was a common understory. There is generally a good canopy cover in most parts along the route, with mature and very tall trees of over 30m in height.



Figure 6-2: Combination of the proposed Canopy walk start points for options 1-3



Figure 6-3: Combination of the proposed Canopy walk options 1-3

6.3.1.4 Option 4 (450m long and with a tower)

Option 4 is the exact replica of option 3 in regard to vegetation coverage found along the route, however, it has a 27m high tower added to it.

6.3.2 Selection Criteria for the location alternatives

The following general criteria were considered during the preliminary assessment of the different route options for the proposed canopy walk.

1. Avoidance of priority sites for biodiversity and ecosystem services
2. Avoidance of areas with species of high conservation concern
3. Easy access by tourists
4. Availability of camping facilities, sanitary facilities, and other recreational facilities
5. Topography
6. Presence of a good and continuous canopy
7. Effects on community resource use areas
8. Future access for maintenance purposes during operation
9. Distance from community areas, main road
10. Visual impact
11. View of the park for amazing tourism experience

At the end of the feasibility studies and engagement with the client and other stakeholders, the final option was selected for the following reasons:

- Close proximity to existing access road, administration facilities, parking area and other services
- Far enough away from the A109/Kampala/Fort Portal road and on the other side of a ridge that cuts off the traffic noise.
- Ideal consistent sloping ground
- Numerous giant fully grown trees
- Excellent view potential out from mid-way into the canopy

The Architectural team recommended the renovation of the existing facilities to accommodate facilities such as the rest rooms, a ticket office, a reception, conference room and a waiting area. These facilities are needed as back-up facilities for the proposed Canopy walk.

6.3.3 Major Environmental issues along the proposed routes

Option 1 and option 2

During the construction, operation and maintenance, there will be minimal vegetation clearance to avoid touching canopy structure. However, effort will be made to avoid trees, so that only a few branches will be affected. The cleared vegetation will be lost permanently. However, only a small area will be required to be cleared (about 1.4-1.8m width and 300m long), no significant impacts or loss of habitats will result.

Option 3 and Option 4

There will be moderate loss of vegetation, covering an area about 1.4m to 1.8m wide, and 450m long for both Options 3 and 4.

6.3.4 Analysis of the route options

Detailed criteria are given in Table 6-1 below.

Table 6-1: Summary of issues (route options for the canopy walk)

Criteria	Option One	Option Two	Option Three	Option 4
Sensitivity (priority site for biodiversity and ecosystem services)	Favourable site for monkeys and birds	Similar to option 1	Similar to option 1	
Species of conservation importance	With some trees of <i>Prunus africana</i> which is Vulnerable as per IUCN	With some trees of <i>Prunus africana</i> which is Vulnerable as per IUCN	With some trees of <i>Prunus africana</i> which is Vulnerable as per IUCN	
Condition of Flora	Vegetation/trees mixed with medium size and strong mature trees and in un disturbed condition	Similar to option 1	Similar to option 1, but being longer, this option has a more continuous canopy cover and more mature and stronger trees.	
Accessibility	Close to existing access road, Sebitoli administration and camping facilities with sanitary facilities, Additional latrines and campsite in proximity.	Similar to option 1	Similar to option 1	
Visual impacts	The option is far removed from the main road, settlements, and has minimal visual obstruction	Similar to option 1	Similar to option 1	
Effect from traffic noise	Not affected by noise from Kampala-Fortportal Road	Similar to option 1	Similar to option 1 and 2	
Site Topography	Is a consistent slope feasible for a Canopy walk.	Similar to option 1	Has consistent slopes, hence feasible for a Canopy walk	
Economic /cost consideration				

Estimated cost for the construction of the canopy walk.	1,095,228 USD	1,297,912 USD	1,646,732 USD	1,849,417 USD

The Economic and financial report indicated that all options are economically viable. The financial analysis report highlights that Option 1 and 2 are feasible at 30 USD per tourist accessing the canopy walkway. The interest rate considered in the analysis is 8%. In addition, Option 3 and 4 are only feasible at 50 USD per tourist accessing the canopy walkway. Option 4 was preferred because of the increased length and the tower which will add on the tourist experience to the facility/area.

The above options have been further analyzed to determine the most preferred option and the scores were assigned to the alternative canopy walk routing based on the analysis as shown in Table 6-2 below and the option with the lowest scores being considered the best option.

Table 6-2: Weighing of alternatives /canopy walk route selection criteria

Criteria	Option 1	Option 2	Option 3	Option 4
Biophysical Environmental impacts				
Criteria-1: Impact on priority sites for biodiversity and ecosystem services	2	2	2	3
Criteria-2: Impact on species of conservation importance	2	2	1	1
Criteria-3: Impacts from vegetation clearance	2	2	3	3
Socio-Economic Consideration				
Criteria-4: Route to avoid or minimize impact on visual or historically sensitive areas.	1	1	1	1
Criteria-5: Where possible, conflicts with residential, commercial and industrial land use such as settlement dwellings, residential, business and airport zones must be avoided. The selected route must deviate from settlement areas and cultivated areas.	1	1	1	1
Criteria-6: Route to minimize impact on significant cultural resources i.e., protected areas, heritage sites, ethnographic and archaeological sites.	1	1	2	2
Engineering Consideration				
Criteria-7: The selected route must comply with all statutory requirements i.e., statutory requirements for clearances to infrastructure e.g., Airport zones, railways and settlement areas must be assessed.	1	1	1	1
Criteria-8: Where possible, major crossings must be avoided or limited i.e., roads, railways and large river and mountain crossings.	1	1	1	1

Criteria-9: The route must be accessible for construction, operation and maintenance. Although access to all locations along the canopy walk is not required, access to every structure location is necessary and must be considered during the route selection process.	1	1	1	1
Economic Factors				
Criteria-10: The selected route should ensure that locations of the canopy structures, and foundations in unfavorable topographical areas such as rivers, wetlands or rough terrain are avoided or limited thus minimizing the impact on the capital cost.	1	1	1	2
Criteria-11: Constructability issues must be considered during the route selection for the canopy walk as capital cost will be impacted (structures, etc.) Canopy walk length and constructability (construction cost) issues must be considered during the route selection process.	1	2	3	3
Total scores	14	15	18	19

Conclusion and recommendation

Based on the analysis in table 6-2 above, Option 1 is the best alternative having scored lowest, however, further examination of the client's objectives for this project concludes that, Option 4 is the most preferred because constructing a 450m long canopy walk with a watch tower would result in achieving the project objectives bulleted further below. The impacts on the environment are generally similar to those of the other route options since all options start and follow the same direction, and though its cost is 1,849,417 USD higher than the other options, its important to provide a facility that will be worthy to add to the regional itinerary. The walkway would allow tourists to enjoy and have a great view of the park, with an added tower. However, the increased height poses a safety risk for the tourists/visitors that may use it, but this has been mitigated during design (sections 2.5, 2.6, 2.7, 2.8 and 2.9) and mitigation measures proposed in sections (7.8.2, 7.10.1, 7.10.5 and 7.11.5) will need to be implemented during construction and operation of the canopy walk.

The feasibility report concluded that, the client shall need to make a final decision on which option to implement because two options were found suitable, Option 2 (300-metre-long with the tower and Option 4 (450m long route plus a watch tower).

Project objectives;

- Provide a new tourism experience.
- Allow exploration and better understanding of the forest canopy
- Generate a new income stream report

Considering UWA project objectives bulleted above, the feasibility report concluded that option 4, a 450m long Canopy walkway with a watch tower would provide a new tourist experience and allow exploration for a better understanding of the forest canopy (Client objective 1).

Basing on the feasibility study results and discussions with the client, the ESIA team was asked to undertake ESIA for route option 4 (450m long plus tower), thus results presented in this ESIA report/ESIS are for Option 4.

7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

7.1 Impact Identification

Identifying impacts during the ESIA aims to recognize and mitigate significant potential effects. Various tools are employed for impact identification, with a common and straightforward approach being the use of impact checklists. Impact checklists were utilised for this short linear project.

Using this uncomplicated tool, various planning problems and considerations surfaced during stakeholder consultations. The significant impacts, were categorized according to project phases including construction, operation, and decommissioning, as outlined below.

The study identified the potential impacts of the project, predicted them and evaluated their significance. Impact identification was done by first summarizing the list identified impacts in the field and later prediction was done using impact correlation matrix. Evaluation of impact significance was done using a range of methods including professional experience, collective and extensive discussions involving the team; bearing in mind stakeholder concerns and a set of criteria that include;

- The magnitude and likelihood of the impact and its spatial and temporal extent
- The likely degree of recovery of the affected environment
- The value of the affected environment
- The level of public concern
- Political repercussions of a proposed development

In addition, the impacts were considered to be significant if they were:

- Extensive over time and space;
- Intensive in concentration or proportion to assimilative capacity of the affected area;
- Exceeding environmental standards or thresholds;
- Not complying with environmental policies, land use plans, sustainability strategy;
- Adversely and seriously affecting ecologically sensitive areas;
- Adversely and serious affecting heritage resources, other land uses, communities or indigenous people's traditions and values.

Mitigation measures and enhancement options were proposed for the significant impacts. The report furnishes information on mitigation and monitoring plans, outlining specific responsibilities to ensure the effective implementation of these measures.

7.1.1 Impacts Associated with the Construction Phase

The following potential impacts were identified for the construction phase:

	194

- **Positive impacts**
- Increased opportunities for employment and other economic activities linked to Canopy Walk construction
- Benefits to local economy resulting from opportunities to provide goods and services for the canopy walk construction
- **Negative impacts**
- Level of wildlife disturbance may increase as a result of frequent construction material manual delivery along the 450m canopy walk alignment.
- Change in scenic quality due to construction of the canopy walk
- Noise pollution due to steel joining and construction equipment
- Change of norms and value arising from increased incomes for the few casual workers and professionals who will be employed on the project during the construction phase as well as UWA staff during the operation phase. In case of accommodation opportunities, the norms and values of those offering accommodation during construction and owners of ecotourism facilities/activities will also change.
- Changes in levels of disease and human health due to movement of workers mainly STDs e.g. Human immunodeficiency virus (HIV) is an infection that attacks the body's immune system. Acquired immunodeficiency syndrome (AIDS) HIV/AIDS, Tuberculosis (TB) etc.
- Increased use of local materials
- Change in population level due to influx of workers and laborers causing pressure to social services, food and facilities.
- Risk of accidents and injuries.

7.1.2 Impacts associated with Operation Phase

- **Positive impacts**
- Benefits to communities resulting from employment and other economic activities linked to canopy walk operation
- Benefits to local economy resulting from opportunities to provide goods and services for the Canopy Walk operation
- Benefits to national economy arising from increased revenue generation from tourism business and employment opportunities to Ugandans.
- **Negative impacts**
- Level of wildlife disturbance may increase as result of more tourists walking above them
- Change in scenic view due to the canopy walk
- Poor solid waste management along the canopy walk
- Compatibility with national policies on development of quality of tourism product facilities for tourism business and increased revenue generation
- Changes in disease patterns and zoonotic risks to human health due to increased presence of humans in the project area.

- Cost to communities arising from increased waste management issues

7.1.3 Impacts associated with Decommissioning Phase

The following impacts are likely to occur during this phase:

- Changes in scenic quality due to protruding watchtower and the movement of workers in and out of the project area hence change in the scenic quality
- Support to national policies that stress on proper handling of canopy walk used material and waste during decommissioning
- Once the facility is decommissioned, there will be loss of employment and income to workers and local community businesses, local economy, KNP and the nation (tour guiding, revenue collection and indirect income for local who will have been offering services)
- Change in life style quality of workers
- Reduced opportunities to adjacent communities after facility closure

7.2 Impact Evaluation

After identifying and predicting the impact's magnitude, extent, and duration an assessment of impact significance was conducted. The initial baseline condition served as the reference point for projecting the future scenario with the proposed project. Changes were then evaluated against national and sectoral policies, laws, guidelines, and applicable standards. Stakeholder perspectives were considered to determine the significance of impacts.

7.2.1 Evaluation of Impact Significance

The assessment of impact significance is a crucial aspect of impact assessment, directly influencing project costs and condition setting. It also plays a key role in selecting project alternatives. Determining impact significance contributes to integrating environmental costs into overall project expenses. Mitigation measures are formulated for impacts deemed significantly negative, while enhancement measures are developed for impacts considered significantly positive.

Different approaches were employed to analyze and assess the significance of impacts, such as expert judgments, experience from comparable projects, adherence to environmental policies, laws, plans, environmental management plans, and environmental standards (when available). Impacts were deemed significant based on the criteria presented in section 7.1 above:

A simple matrix below with the following ratings was used to determine significant impacts:

No	Rating	Description of Rating
1	+3	Very low positive impact to the project or receptor

	196

2	+2	Moderate positive impact to the project or receptor
4	+1	High positive impact (Impact has advantages to the project or receptor)
5	0	No impacts
6	-1	High negative impact (Impact is disadvantageous to the project or receptor)
7	-2	Moderate negative impacts to the project or receptor
8	-3	Very low negative impacts to the project or receptor

7.3 Impacts Associated with Project Phases

Mitigation and enhancement measures are developed for significant impacts that were rated +3, +2 +1, 0, -1, -2, and -3. In the next sections, significant impacts (positive and negative) associated with each phase of the project are discussed followed by mitigation, enhancement measures and project alternatives.

Table 7-1: Impact Correlation Matrix for the proposed development of the Canopy Walk in Sebitoli KNP

Project phases		Construction Phase										Operation Phase				Decommissioning Phase			
Activities		Recruitment of labor force	Establishment of Canopy Walk	Frequent movements of laborers	Construction traffic	Foundation Construction	Support Structure Installation	Walkway Construction	Safety Features Installation	Finishing and landscaping	Quality Assurance and Testing	Solid waste disposal	Visitor Pressure	Recruitment of labor	Safety Concerns	Removal of material	Laying off Laborers	Removing of canopy walk	Removal of concrete material
Impacts	Impacts Related to Physical Environment																		
Impacts Related to Physical Environment	Incompatibility with KNP's - GMP	0	-3	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0
	Increased human presence	0	-3	-3	-3	0	-3	-3	-3	-3	0	-3	-2	0	-3	-3	0	-3	-3
	Vegetation removal	0	0	0	0	-3	-3	-3	0	0	0	0	0	0	0	-3	0	-3	-3
	Visual intrusion/disruption	0	0	0	0	-3	-3	-3	-3	0	0	-3	-2	0	0	-3	0	-3	-3
	Disruption of ecological processes	0	0	0	0	-3	-3	-3	0	0	0	-3	-2	0	0	-3	0	-3	-3
	Structural degradation	0	0	0	0	-3	-3	-3	0	0	0	-3	-2	0	0	-3	0	-3	-3
	Risk of accidents/Incidences	0	0	0	-1	-3	-3	-1	-1	-3	0	0	-1	0	0	-3	0	-1	-1
	Resource consumption	0	0	0	0	-3	-3	0	0	0	0	0	-2	0	0	0	0	0	0
	Structural removal	0	0	0	-3	-3	-3	0	0	0	0	0	-2	0	0	0	0	0	-3
	Residual impact	0	0	0	0	-3	-3	0	0	0	0	0	0	0	0	0	0	0	0
	Noise pollution	0	-2	-2	-3	-3	-3	-3	-3	-3	0	-3	-3	0	0	-2	-3	-3	-3
	Effects on Air quality	0	0	0	0	-3	0	0	0	-3	0	-3	0	0	0	-3	0	-3	-3
	Altered water quality	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	-3	0	-3	-3
	Risk of soil contamination	0	-3	0	0	-3	0	-3	0	-3	0	-3	0	0	0	-3	0	-3	-3
	Ground disturbance	0	-3	-3	0	-3	0	-3	0	-3	0	-3	0	0	0	-3	0	-3	-3
	Waste generation & Management	0	-3	-3	0	-3	-3	-3	-3	-3	0	0	-3	0	-3	-3	0	-3	-3
Impacts Related to Ecological & Biological Environment																			
	Species diversity	0	-3	-3	-3	-3	-3	-3	-3	-3	0	-3	-3	0	0	-3	0	0	-3

Project phases		Construction Phase										Operation Phase				Decommissioning Phase			
Activities		Recruitment of labor force	Establishment of Canopy Walk	Frequent movements of laborers	Construction traffic	Foundation Construction	Support Structure Installation	Walkway Construction	Safety Features Installation	Finishing and landscaping	Quality Assurance and Testing	Solid waste disposal	Visitor Pressure	Recruitment of labor	Safety Concerns	Removal of material	Laying off Laborers	Removing of canopy walk	Removal of concrete material
Impacts Related to Ecological & Biological Environment	Exotic species	0	-3	-3	-3	-3	-3	-3	-3	-3	0	-1	-1	0	0	0	0	0	0
	Disruption of wildlife	0	-3	-3	-3	-3	-3	-3	-3	-3	0	0	-3	0	0	0	0	0	0
	Habitat diversity & loss	0	-3	-3	0	0	-3	-3	0	-3	0	0	-3	0	0	0	0	0	0
	Introduction of invasive species	0	-3	-1	-3	-3	-3	-3	-3	-3	0	-1	-1	0	0	0	0	0	0
	Accidental wildlife disturbance	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0
	Altered prey-predator dynamics	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0
	Loss of nesting sites	0	-2	-2	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0
	Spread of diseases	0	0	-1	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0
	Altered plant - animal interaction	0	-3	-3	0	0	0	0	0	0	0	0	-3		0	0	0	0	0
	Use of local resources	0	-3	-3	-3	-3	-3	-3	-3	-3	0	-3	-3	-3	0	0	0	0	0
	Increased human presence	0	-3	-3	0	0	0	0	0	0	0	0	-2		0	0	0	0	0
Impacts Related to Socio-Economic Environment																			
Impacts Related to Socio-Economic Environment	Job creation	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
	Income generation	3	0	0	0	0	0	3	0	0	0	0	0	3	0	0	0	0	0
	Tourism development	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Infrastructure development	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Community engagement	1	0	0	0	0	0	3		3	0	0	1	3	0	0	0	0	0
	Social disruption	-3	-3	-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Loss of livelihoods	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	0

Project phases		Construction Phase										Operation Phase				Decommissioning Phase			
Activities		Recruitment of labor force	Establishment of Canopy Walk	Frequent movements of laborers	Construction traffic	Foundation Construction	Support Structure Installation	Walkway Construction	Safety Features Installation	Finishing and landscaping	Quality Assurance and Testing	Solid waste disposal	Visitor Pressure	Recruitment of labor	Safety Concerns	Removal of material	Laying off Laborers	Removing of canopy walk	Removal of concrete material
	Community health & safety risks	0	0	-3	0	0	0	0	0	0	0	0	-3	0	-3	0	0	0	0
	Tourism revenue	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Community development	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Cultural exchange	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Education awareness	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	Cultural disruption	0	0	0	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0
	Overcrowding congestion	0	0	0	0	0	0	0	0	0	0	-3	-2	0	0	0	0	0	0
	Economic dependency	0	0	0	0	0	0	0	0	0	0	0	-3	0	0	0	0	0	0
Impacts associated with the Legal Framework																			
Impacts associated with the Legal Framework	Permitting challenges	-3	-3	0	0	0	0	0	-3	0	0	0	0	0	0	0	-3	0	0
	Violation of laws	-3	-3	0	0	0	0	0	0	0	0	-3	-3	0	0	0	-3	0	0
	Land use conflicts/GMP	0	0	0	0	0	0	-3	0	0	0	0	0	0	0	0	0	0	0
	Contractual disputes	-3	-3	0	0	0	0	0	0	0	0	0	0	-3	0	0	-3	0	0
	Regulatory compliance	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	0	0	0	0
	Public safety regulations	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
	Regulatory changes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0
	Restoration obligation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0
	Abandonment liability	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0
	Contractual agreements	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0	0
	Closure & access restrictions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3	0

Project phases		Construction Phase										Operation Phase				Decommissioning Phase			
Activities		Recruitment of labor force	Establishment of Canopy Walk	Frequent movements of laborers	Construction traffic	Foundation Construction	Support Structure Installation	Walkway Construction	Safety Features Installation	Finishing and landscaping	Quality Assurance and Testing	Solid waste disposal	Visitor Pressure	Recruitment of labor	Safety Concerns	Removal of material	Laying off Laborers	Removing of canopy walk	Removal of concrete material
	Regulatory enforcement	-3	0	-3	-3	0	0	0	0	0	0	-3	-3	-3	-3	-3	-2	-3	-3

7.4 Pre-Construction Phase Impacts (Legal / Regulatory Framework)

7.4.1 Permitting Challenges

Obtaining the necessary permits for construction in a protected area can be time-consuming and complex due to stringent environmental regulations and legal frameworks governing land use and conservation. **The impact was rated -3 Low.**

Mitigation measures

- (a) Initiate early engagement and consultation with regulatory authorities responsible for managing the park to understand permit requirements, environmental regulations, and conservation objectives. Seek guidance on the permit application process, documentation requirements, and timelines to streamline the permitting process. Develop a comprehensive project plan that incorporates environmental considerations, habitat assessments, and mitigation measures to address potential impacts on the protected area. Design the project to minimize disturbance to sensitive habitats, species, and ecological resources, which can facilitate permit approval.
- (b) Arrange pre-application meetings with regulatory authorities to discuss project plans, environmental impacts, and permit requirements before formally submitting permit applications. Use these meetings to clarify expectations, address concerns, and identify potential issues early in the process to expedite permit review and approval.
- (c) Retain qualified environmental consultants, permit specialists, or legal counsel with expertise in navigating the permit process for construction in protected areas. Seek assistance from professionals who understand the regulatory landscape, have experience with similar projects, and can provide guidance on compliance requirements.
- (d) Prepare thorough, complete, and accurate permit applications that address all regulatory requirements, documentation needs, and environmental considerations. Provide detailed project descriptions, environmental impact assessments, mitigation plans, and supporting data to facilitate efficient permit review and approval.
- (e) Engage with stakeholders, including local communities, indigenous groups, conservation organizations, and other interested parties, to solicit input, address concerns, and build support for the project. Demonstrate a commitment to environmental stewardship, sustainable development, and responsible land use practices to gain stakeholder buy-in.
- (f) Respond promptly to requests for additional information, clarification, or revisions from regulatory authorities during the permit review process. Maintain open lines of communication and provide requested documentation or modifications in a timely manner to expedite permit approval and minimize delays.
- (g) Commit to strict compliance with permit conditions, environmental safeguards, and mitigation measures specified in approved permits. Implement monitoring programs, reporting requirements,

and compliance protocols to ensure adherence to permit conditions throughout the construction phase and beyond.

7.4.2 Violation of Environmental Laws

Inadequate compliance with environmental laws and regulations during the construction phase, such as habitat protection laws or regulations related to protected species and the neighboring community in Sebitoli village, can lead to legal challenges, fines, and project delays. **The impact was rated -3 Low.**

Mitigation measures

- (a) Conduct a comprehensive environmental and social impact assessment (ESIA) prior to construction to identify potential environmental risks, impacts, and regulatory requirements. Assess the project's potential effects on habitats, species, water quality, air quality, and other environmental factors to inform mitigation measures and compliance strategies.
- (b) Conduct a thorough review of applicable environmental laws, regulations, permits, and approvals to ensure compliance with relevant requirements. Seek guidance from environmental consultants, legal counsel, or regulatory experts to interpret and understand regulatory obligations and develop strategies for compliance.
- (c) Conduct habitat surveys and species assessments to identify the presence of protected habitats, endangered species, or other sensitive ecological resources within the park. Develop mitigation measures and avoidance strategies to minimize impacts on these resources and comply with habitat protection laws and regulations.
- (d) Implement measures highlighted in the park management plan to protect endangered/threatened species.
- (e) Implement measures such as habitat restoration, species relocation, nesting season restrictions, and exclusion zones to protect sensitive species and comply with regulatory requirements.
- (f) Implement monitoring programs and supervision protocols to oversee construction activities and ensure compliance with environmental laws and regulations. Assign qualified environmental monitors or ecologists to assess compliance with permit conditions, mitigation measures, and best management practices throughout the construction phase.
- (g) Provide training and awareness programs for construction personnel, contractors, and subcontractors on environmental laws, regulations, and compliance requirements. Ensure that all workers are informed about their responsibilities for protecting habitats, species, and natural resources during construction activities.
- (h) Engage with regulatory agencies, conservation organizations, local communities, and indigenous groups to seek input, share information, and address concerns related to environmental compliance during construction. Foster collaboration and transparency to build trust and facilitate compliance with regulatory requirements.

- (i) Develop contingency plans and emergency response procedures to address unforeseen environmental incidents or compliance issues that may arise during construction. Establish protocols for reporting incidents, implementing corrective actions, and communicating with regulatory authorities to minimize the risk of fines, penalties, or project delays.

7.4.3 Land Use/KNP users' Conflicts

Construction of the canopy walk may trigger conflicts with existing land use designations or management plans for the protected area, leading to legal disputes, litigation, and delays in project implementation. The researchers, chimpanzee trekking teams, birders and visitors to the canopy walk may conflict at some point hence affecting activities in the sector. **The impact was rated 0.**

Mitigation measures

- (a) Initiate early engagement with relevant stakeholders, including park authorities, conservation organizations, local communities, and indigenous groups, to identify potential conflicts with existing land use designations or management plans. Seek input, feedback, and collaboration to address concerns and explore mutually beneficial solutions.
- (b) Conduct a comprehensive impact assessment to evaluate the potential environmental, social, and cultural impacts of the canopy walk construction on the protected area and surrounding ecosystems. Identify areas of potential conflict with existing land use designations or management plans and develop strategies to minimize adverse effects.
- (c) Ensure that the design and location of the canopy walk are aligned with the management objectives, conservation goals, and zoning regulations of the protected area. Modify project plans as necessary to minimize conflicts and enhance compatibility with existing land use designations or management plans.
- (d) Obtain all necessary permits, approvals, and authorizations from relevant regulatory authorities responsible for managing the park. Ensure compliance with applicable laws, regulations, and environmental standards to mitigate legal risks and prevent delays in project implementation due to regulatory non-compliance.
- (e) Engage local communities and stakeholders in the decision-making process regarding the construction of the canopy walk. Solicit input, address concerns, and incorporate community preferences into project planning and design to build local support and minimize opposition.
- (f) Develop and implement mitigation measures to minimize the impacts of canopy walk construction on the park and surrounding environment. Explore opportunities for habitat restoration, biodiversity conservation, and ecological offsets to compensate for any adverse effects and enhance overall conservation outcomes.
- (g) Establish transparent and accessible mechanisms for resolving conflicts or disputes that may arise during the construction of the canopy walk. Provide avenues for mediation, arbitration, or other forms

of alternative dispute resolution to facilitate constructive dialogue and reach mutually acceptable resolutions.

- (h) Implement adaptive management practices to monitor the impacts of canopy walk construction on the park and adapt project plans and management strategies accordingly. Regularly monitor environmental indicators, community feedback, and compliance with land use designations to identify and address emerging conflicts or issues proactively.

7.4.4 Contractual Disputes

Legal disputes may arise between project developers, contractors, and subcontractors over contractual obligations, project specifications, delays, or cost overruns, leading to litigation and financial liabilities. **The impact was rated -3 Low.**

Mitigation measures

- (a) Ensure that contracts between project developers, contractors, and subcontractors are clear, comprehensive, and accurately reflect the parties' obligations, responsibilities, and expectations. Clearly define project scope, specifications, milestones, deliverables, payment terms, and dispute resolution procedures to minimize ambiguity and potential areas of disagreement.
- (b) Foster open lines of communication and collaboration between project stakeholders throughout the project lifecycle to proactively address issues, resolve disputes, and prevent conflicts from escalating into legal disputes. Schedule regular meetings, progress updates, and project reviews to maintain alignment and transparency among all parties involved.
- (c) Include dispute resolution mechanisms, such as mediation, arbitration, or alternative dispute resolution (ADR) clauses, in contracts to facilitate timely and cost-effective resolution of disputes without resorting to litigation. Specify procedures for initiating, conducting, and resolving disputes through ADR processes to provide a framework for resolving conflicts amicably.
- (d) Implement robust performance monitoring and oversight mechanisms to track progress, quality, and compliance with contractual requirements throughout the project lifecycle. Conduct regular inspections, quality assurance checks, and milestone reviews to identify potential issues early and take corrective action as needed to prevent disputes from arising.
- (e) Establish clear change management procedures to manage modifications, variations, or amendments to project scope, specifications, or timelines during the course of the project. Document changes in writing, obtain necessary approvals, and communicate changes to all relevant parties to minimize misunderstandings and disputes over scope creep or contract modifications.
- (f) Maintain accurate and comprehensive documentation of project-related communications, decisions, agreements, and transactions to establish a clear record of events and actions taken by all parties involved. Keep detailed records of correspondence, meeting minutes, change orders, and project documentation to support claims or defenses in the event of a dispute.

- (g) Conduct legal reviews and risk assessments of contracts, project agreements, and dispute resolution clauses to identify potential legal risks, liabilities, and exposure to litigation. Seek advice from legal counsel with expertise in construction law, contract law, and dispute resolution to ensure that contracts are legally enforceable and adequately protect the interests of all parties.
- (h) Obtain appropriate insurance coverage, such as professional liability insurance, performance bonds, or surety bonds, to protect against potential financial liabilities and litigation risks arising from disputes or claims related to project performance. Ensure that insurance policies provide adequate coverage for legal defense costs, judgments, and settlements associated with litigation.

7.5 Construction Phase Impacts (Biological Environment)

7.5.1 Vegetation Removal

Clearing of vegetation for the construction of access roads, support structures, and the canopy walk itself can lead to loss of habitat for native flora and fauna. It can also disrupt natural plant succession processes.

The impact is rated -3 Low.

Mitigation measures

- (a) To minimize vegetation removal, implement a vegetation clearing plan (and undertake preclearance surveys) that help minimize habitat disturbance by identifying any occurrence of sensitive species.
- (b) Conduct a thorough ecological assessment prior to clearing to identify sensitive sections where important species are seen or recorded before construction, and adjust construction plans accordingly to avoid or minimize impacts.
- (c) Sensitize the project construction teams about the relevance of vegetation and tree conservation on projects to promote a positive conservation culture on the project
- (d) Monitor the effectiveness of mitigation measures and adjust plans as needed based on ongoing ecological monitoring and feedback from experts.

7.5.2 Disruption of Ecological Processes

The construction phase may disrupt important ecological processes such as nutrient cycling, hydrological regimes, and seed dispersal. These disruptions can have cascading effects on ecosystem functioning and biodiversity. **The impact is rated -3 Low.**

Mitigation measures

- (a) Preserve and protect existing habitats within and adjacent to the construction site by implementing buffer zones, conservation easements, or land set-asides. Additionally, consider habitat restoration efforts to compensate for any loss of habitat due to construction activities.

- (b) Avoid construction activities in sensitive areas such as breeding points, whenever feasible. Minimize disturbance to these areas by rerouting infrastructure or implementing alternative construction methods.
- (c) Implement a phased construction approach that minimizes the extent and duration of ecological disturbances. This approach allows for the completion of construction activities in smaller, manageable sections while providing opportunities for ecological recovery in between phases.
- (d) Revegetate disturbed areas with native plant species to stabilize soils, enhance habitat diversity, and promote ecological recovery in the recovering entire sawmill area. Consider landscaping techniques that mimic natural ecosystems and support local biodiversity.
- (e) Establish monitoring programs to assess the effectiveness of mitigation measures and track changes in ecosystem functioning and biodiversity over time. Use this information to inform adaptive management strategies and adjust as needed to achieve conservation goals.
- (f) Engage with stakeholders, including local communities, conservation organizations, and regulatory agencies, to foster understanding and support for ecological conservation efforts during the construction phase. Educate project personnel and contractors about the importance of protecting biodiversity and minimizing ecological impacts.

7.5.3 Introduction of Invasive Species

Construction activities can inadvertently introduce invasive plant species or pests to the protected area, which may outcompete native species and disrupt ecosystem dynamics. **The impact is rated -1 High.**

Mitigation measures

- (a) Conduct a comprehensive risk assessment to identify potential sources e.g. safety shoes, safety clothing, construction material etc. of invasive species introduction and prioritize areas of concern within and around the construction site. This assessment can guide targeted mitigation efforts.
- (b) Implement measures to prevent the introduction of invasive species by inspecting construction equipment, vehicles, and materials for hitchhiking seeds, propagules, or pests before entering KNP. Train construction personnel to recognize and report invasive species sightings promptly.
- (c) Establish protocols for incoming construction materials and equipment to prevent the unintentional introduction of invasive species. Implement treatment procedures, such as cleaning, disinfection, or heat treatment, for items originating from regions known to harbor invasive species.
- (d) Prioritize and ensure the use of native plant species in revegetation and landscaping efforts within and around the construction site. Restore disturbed areas with locally sourced native plants to enhance habitat quality and reduce the susceptibility of ecosystems to invasion by non-native species.

- (e) Develop vegetation management plans to control invasive species already present within the construction site area. Implement targeted control measures, such as mechanical removal, r biological control, to suppress invasive species populations and prevent their spread.
- (f) Implement regular monitoring programs to detect and assess the presence and abundance of invasive species within and adjacent to the construction site. Utilize citizen science initiatives e.g. ranger and tour guide monitoring, remote sensing technologies, and trained personnel to monitor invasive species dynamics and prioritize management actions.
- (g) Establish biosecurity protocols for construction personnel and vehicles to prevent the unintentional transport of invasive species between construction sites and KNP. Provide training and resources to promote awareness of biosecurity risks and best practices for minimizing invasive species spread.
- (h) Raise awareness among construction personnel, visitors, and local communities about the threats posed by invasive species and the importance of preventing their introduction and spread. Offer educational materials, workshops, and outreach programs to promote responsible behavior and engagement in invasive species management.
- (i) Adopt an adaptive management approach to invasive species management, incorporating feedback from monitoring and research activities to refine mitigation strategies over time. Invest in research to improve understanding of invasive species ecology, dynamics, and control methods applicable to KNP ecosystems.

7.5.4 Habitat Loss

Clearing of vegetation and excavation for construction activities can result in the direct loss of habitat for native plant and animal species. This loss can disrupt ecosystems and reduce biodiversity within the protected area. ***The impact is rated -3 Low.***

Mitigation measures

- (a) Prioritize habitat preservation and minimization of impacts by carefully planning construction activities to avoid or minimize the clearing of vegetation and disturbance of sensitive habitats. Conduct thorough site assessments and ecological surveys to identify and protect critical habitat areas and biodiversity hotspots.
- (b) Develop vegetation restoration and offsetting plans to compensate for the loss of habitat caused by construction activities. Implement reforestation, revegetation, and habitat enhancement projects in nearby areas to create new habitat and enhance biodiversity, offsetting the ecological impacts of habitat loss.
- (c) Integrate green infrastructure elements into construction designs and site plans to preserve and enhance habitat connectivity, green corridors, and wildlife movement pathways. Design features such as vegetated buffer zones, wildlife-friendly landscaping, and green roofs to provide habitat refuges and promote ecological connectivity across the landscape.

- (d) Establish exclusion zones or buffer areas around sensitive habitats, critical nesting sites, and protected species habitats to prevent direct impacts from construction activities. Implement fencing, signage, and access restrictions to limit disturbance and preserve undisturbed areas for wildlife conservation.
- (e) Schedule construction activities to minimize disruption to wildlife breeding seasons, migration periods, and critical life stages. Coordinate construction timing and phasing to avoid peak activity periods for sensitive species and minimize habitat disturbance during key ecological events.
- (f) Implement biodiversity monitoring programs to assess the impact of construction activities on native plant and animal species and track changes in biodiversity over time. Use monitoring data to inform adaptive management strategies and adjust construction practices to minimize ecological impacts and protect biodiversity.

7.5.5 Disruption of Wildlife

Noise, vibrations, and human presence associated with construction activities can disturb wildlife, causing stress, changes in behavior, and displacement from their natural habitats. Sensitive species like elephants, buffalos, forest hogs, angulates among others may be particularly vulnerable to these disturbances. **The impact is rated -3 Low.**

Mitigation measures

- (a) Conduct thorough wildlife surveys and ecological assessments to identify the presence of sensitive species and their habitats within and adjacent to the construction area. Use this information to inform project planning and design measures to minimize impacts on wildlife.
- (b) Establish exclusion zones or buffer areas around known wildlife habitats, migration routes, and critical breeding or feeding areas to minimize disturbance from construction activities. Implement access restrictions, signage, and barriers to prevent intrusion into sensitive wildlife areas.
- (c) Schedule construction activities to minimize noise-generating activities, such as blasting or heavy machinery operation, during sensitive periods for wildlife, such as breeding seasons or critical life stages. Coordinate construction timing to avoid peak activity times for sensitive species and minimize disruption to their behavior and habitats.
- (d) Implement noise and vibration control measures, such as using quieter construction equipment, installing sound barriers, or employing vibration damping techniques, to reduce the impact of construction-related disturbances on wildlife. Limit the duration and intensity of noisy activities to minimize stress and disturbance to sensitive species.
- (e) Implement wildlife monitoring programs to assess the impact of construction activities on sensitive species and monitor changes in behavior, population dynamics, and habitat use. Use monitoring data to identify potential impacts and implement mitigation measures to minimize disturbance and support wildlife conservation goals.

- (f) Provide training and awareness programs for construction personnel to educate them about the presence of sensitive wildlife species, their habitats, and the importance of minimizing disturbance. Train workers in wildlife-friendly construction practices and protocols for responding to wildlife encounters to prevent conflicts and minimize impacts.
- (g) Implement habitat restoration and enhancement projects in and around construction areas to mitigate the loss of habitat and provide alternative habitat features for wildlife. Plant native vegetation, create water sources, and establish wildlife-friendly landscaping to compensate for habitat disturbance and support wildlife populations.

7.5.6 Disturbance to nesting sites

Construction activities can disturb nesting sites for birds and other wildlife, leading to abandonment of nests, reduced reproductive success, and population declines for vulnerable species. Some of the wildlife that could be affected include: Birds (songbirds, raptors, waterfowl, and shorebirds), Reptiles (turtles and snakes), Amphibians (frogs), small mammals (rabbits, squirrels, and mice) and invertebrates (butterflies, bees, and dragons) as presented in section 4.2. **The impact is rated -3 Low.**

Mitigation measures

- (a) Conduct thorough surveys of the construction area to identify nesting sites and habitats of vulnerable species. This helps in planning and implementing appropriate mitigation measures.
- (b) Establish buffer zones around known nesting sites to minimize disturbance. Fencing or signage can be used to demarcate these areas and prevent access by construction personnel and equipment.
- (c) Schedule construction activities outside of the breeding season for sensitive wildlife species. This reduces the likelihood of disturbing nesting sites and young offspring.
- (d) Implement habitat enhancement measures such as planting native vegetation or installing nest boxes to compensate for any habitat loss resulting from construction activities.
- (e) Conduct regular monitoring of construction sites to ensure compliance with environmental regulations and mitigation measures. This includes monitoring for the presence of nesting birds and other wildlife.

7.5.7 Loss of Native Vegetation

Clearing of vegetation for construction purposes can result in the loss of native plant species, including those with ecological importance such as food sources, shelter, and nesting sites for wildlife. **The impact is rated -3 Low.** It is anticipated that this impact will low, since the design has been planned that tree clearing will be avoided hence the python design.

Mitigation measures

- (a) Conduct thorough vegetation surveys prior to construction to identify areas of high ecological value and species of concern. Designate these areas for preservation and avoid clearing whenever possible.
- (b) Implement selective clearing practices that target only the necessary vegetation for construction while preserving as much native vegetation as possible. This may involve using hand-clearing methods or machinery with precision attachments.
- (c) Develop a revegetation plan to restore cleared areas with native plant species after construction is complete. This can help to recreate habitat and ecosystem functions lost during construction.
- (d) Implement invasive species management strategies to prevent the colonization of cleared areas by non-native plants. This may involve regular monitoring and removal of invasive species.

7.6 Construction Phase Impacts (Physical Environment)

7.6.1 Soil Disturbance

Excavation, grading, and soil compaction during construction can disturb soil structure and composition, leading to erosion, nutrient loss, and changes in soil fertility. These disturbances can affect plant growth and soil-dependent organisms. **The impact is rated -3 Low.**

Mitigation measures

- (a) Implement erosion control measures such as keep vegetation cover to stabilize exposed surfaces and prevent soil movement.
- (b) Conduct soil rehabilitation and restoration activities post-construction, including soil aeration, and allow recovery of forest undergrowth.
- (c) Regularly monitor soil conditions throughout the construction process and adjust mitigation measures as needed to minimize soil disturbance and protect soil health.
- (d) Educate construction workers on the importance of soil conservation practices and train them in proper construction techniques to minimize soil disturbance.
- (e) Implement erosion control measures such as silt traps, mulching to prevent soil erosion during construction activities.
- (f) Establish vegetative buffer zones around construction sites to help absorb runoff water, reduce erosion, and maintain soil stability.
- (g) Utilize soil stabilization techniques such as hydroseeding, geotextiles, or soil binders to stabilize exposed soil and prevent erosion.
- (h) Install sediment control structures such as sediment traps or sediment basins to capture sediment-laden runoff water and prevent it from entering water bodies.
- (i) Minimize the extent of soil disturbance by carefully planning construction activities and using techniques such as trenchless construction methods or construction mats to protect the soil.

- (j) Implement revegetation and restoration plans to restore disturbed areas with native vegetation, helping to stabilize soil, prevent erosion, and promote biodiversity.

7.6.2 Water Pollution

Runoff from construction sites may carry sediment, pollutants, and construction chemicals into nearby water bodies, leading to sedimentation, water contamination, and degradation of aquatic habitats. **The impact is rated -3 Low.**

Mitigation measures

- (a) Install silt fencing or barriers around the pits and columns to contain sediment and debris, preventing them from flowing on the slope entering the downstream streams and R. Mpanga.
- (b) Implement erosion control practices such as mulching, seeding, and installing erosion control blankets to stabilize exposed soil and reduce erosion.
- (c) Design and implement effective stormwater management systems.
- (d) Develop and implement site-specific sediment and erosion control plans that outline measures to minimize runoff and prevent pollution from leaving the site.
- (e) Train construction personnel on best management practices to minimize erosion and sedimentation, such as proper grading techniques, stockpile management, and equipment maintenance to reduce soil disturbance.
- (f) Conduct regular inspections of the construction site to ensure compliance with erosion control measures and promptly address any issues or deficiencies identified.
- (g) Incorporate sustainable construction practices, such as using permeable paving materials, minimizing impervious surfaces, and implementing green infrastructure, to reduce the generation of runoff from the site.
- (h) Develop contingency plans to address unexpected events, such as heavy rainfall or equipment failures, to prevent runoff and pollution incidents.
- (i) Implement erosion control practices such as silt fences, erosion control blankets, or sediment barriers to prevent sediment from being washed into nearby water bodies by runoff.
- (j) Establish vegetative buffer strips along water bodies to filter runoff water, trap sediment, and reduce the transport of pollutants into aquatic habitats.
- (k) Minimize the extent of disturbed areas during construction by using techniques such as phased construction, limiting clearing and grading activities, and employing trenchless construction methods where feasible.
- (l) Implement sustainable construction practices such as using environmentally friendly construction materials, properly storing and handling construction chemicals to prevent spills, and minimizing the use of harmful chemicals on site.
- (m) Ensure that waste is adequately managed to avoid pollution/contamination.

7.6.3 Visual Intrusion

The installation of structures such as towers, platforms, and walkways can alter the visual aesthetics of the landscape, detracting from its natural beauty. This visual intrusion may affect the experience of visitors and compromise the integrity of the protected area. **The impact was rated -3 Low.**

Mitigation measures

- (a) Design structures to blend harmoniously with the surrounding forest canopy by using relevant materials, colors, and architectural styles that complement the environment as already put in the design.
- (b) Conduct visual impact assessments prior to construction to identify sensitive viewpoints and scenic areas, and adjust the design and placement of structures accordingly to minimize visual intrusion.
- (c) Implement screening or camouflage techniques, such as vegetation planting or strategic placement of structures behind natural features, to visually integrate them into the forest canopy and reduce their visibility from key viewpoints.
- (d) Limit the height, size, and number of structures to minimize their visual prominence and maintain the scale and character of the forest.
- (e) Educate visitors about the purpose and importance of installed structures, as well as the need to preserve the beauty of the forest landscape, through interpretive signage, guided tours, and visitor orientation programs.
- (f) Monitor the visual impacts of installed structures over time and implement adaptive management measures as needed to address any unforeseen impacts or changes in visitor perceptions.

7.6.4 Noise Pollution

Construction activities typically generate noise pollution, which can disturb wildlife and disrupt natural behaviors such as breeding, feeding, and communication. This disturbance may have long-lasting effects on the ecological balance of the protected area. **The impact is rated -3 Low.**

Mitigation measures

- (a) Establish a construction noise management plan that outline specific noise control measures and mitigation strategies to minimize noise levels and duration of exposure.
- (b) Schedule construction activities during periods of low wildlife activity, such as early morning or late evening, to minimize disruption to sensitive species.
- (c) Designate buffer zones or wildlife corridors around elephant routes to minimize direct exposure of wildlife to construction noise.
- (d) Implement regular monitoring of noise levels during construction to ensure compliance with established noise limits and promptly address any exceedances through adjustments to construction practices or equipment.

- (e) Educate construction workers and contractors about the importance of minimizing noise pollution and following noise management protocols to minimize impacts on wildlife and their habitats.
- (f) Incorporate noise reduction measures into the design and layout of construction sites, such as strategic placement of equipment, use of natural barriers, and optimization of construction methods to minimize noise propagation.

7.7 Construction Phase Impacts (Socio-Economic Environment)

7.7.1 Job Creation

Construction projects require labor, including skilled and unskilled workers, providing employment opportunities for local residents. This can stimulate economic activity and alleviate unemployment in nearby communities.

Enhancement measures

- (a) Prioritize the hiring of local residents for construction jobs, including both skilled and unskilled labor positions. Work closely with local labor unions, job centers, and community organizations to identify and recruit qualified candidates from nearby communities.
- (b) Offer training programs to equip local residents with the necessary skills for employment in the construction industry. Partner with vocational schools and workforce development agencies to provide hands-on training and mentorship.
- (c) Engage with local communities early in the planning stages of construction projects to solicit input, address concerns, and build support for the initiative. Hold community meetings, workshops, and information sessions to provide updates and gather feedback from residents.
- (d) Provide opportunities for local subcontractors, suppliers, and small businesses to participate in construction projects as vendors or service providers. Seek out qualified local firms for subcontracting work and procurement opportunities wherever feasible.
- (e) Implement labor agreements and standards that ensure fair wages, safe working conditions, and equal employment opportunities for all workers involved in the construction project. Adhere to local labor laws, regulations, and industry best practices to protect workers' rights and well-being.
- (f) Promote diversity and inclusion in the construction workforce by actively recruiting and retaining workers from underrepresented groups, including women, minorities, veterans, and individuals with disabilities. Create a welcoming and inclusive work environment that values diversity and fosters mutual respect.
- (g) Negotiate community benefits agreements that outline specific benefits, investments, and commitments to be provided by the project developer in exchange for community support. Ensure that the agreement addresses the needs and priorities of local residents and contributes to long-term community development.

7.7.2 Income Generation

Construction activities may generate income for local businesses, such as construction firms, suppliers of materials, equipment rental companies, and hospitality services catering to construction workers.

Enhancement measures

- (b) Implement local procurement policies that prioritize sourcing materials, supplies, and services from local businesses whenever feasible. Establish relationships with local suppliers, manufacturers, and distributors to support the local economy and reduce transportation costs.
- (c) Launch vendor outreach programs to connect local businesses with opportunities to participate in construction projects as suppliers, subcontractors, or service providers. Provide information sessions, networking events, and matchmaking services to facilitate business partnerships.
- (d) Promote supplier diversity by actively seeking out and contracting with minority-owned, women-owned, and veteran-owned businesses for construction-related goods and services. Create supplier diversity programs that encourage inclusivity and support economic empowerment within the community.
- (e) Offer business capacity building programs and workshops to help local businesses strengthen their operations, enhance their competitiveness, and access new markets. Provide training in areas such as financial management, marketing, procurement practices, and quality control.
- (f) Subcontract portions of the construction work to local firms and subcontractors, allowing them to contribute to the project and benefit from the economic opportunities it generates. Break down larger contracts into smaller, more manageable packages to facilitate participation by small and minority-owned businesses.
- (g) Negotiate community benefit agreements that include provisions for supporting local businesses and entrepreneurs affected by the construction project. Allocate a portion of the project budget to fund business assistance programs, grants, loans, or technical support services for local businesses.
- (h) Launch promotional campaigns to raise awareness of local businesses and encourage construction workers and contractors to patronize them. Create directories, maps, and online platforms that showcase local businesses offering goods and services relevant to the construction industry.
- (i) Collaborate with local equipment rental companies to supply construction machinery, tools, and equipment needed for the project. Prioritize contracts with local rental providers and establish long-term partnerships that benefit both parties.

7.7.3 Tourism Development

The construction of a forest canopy walk will enhance the tourism infrastructure of the region, attracting visitors and generating revenue for local businesses, accommodations, restaurants, and recreational services.

Enhancement measures

- (a) Launch targeted marketing campaigns to promote the forest canopy walk as a must-visit attraction in the region. Utilize a mix of digital marketing, social media, and travel publications to reach potential visitors and generate interest in the destination.
- (b) Collaborate with local accommodations, restaurants, and recreational services to create tourism packages that include access to the forest canopy walk. Offer bundled experiences, discounts, and special offers to attract visitors and encourage longer stays.
- (c) Enhance the visitor experience by providing amenities such as rest areas, information kiosks, and guided tours at the forest canopy walk site. Partner with local tour operators and guides to offer informative and engaging experiences for visitors.
- (d) local cuisine and culinary experiences at nearby restaurants and eateries, providing visitors with opportunities to sample regional specialties and support local food producers. Promote farm-to-table dining experiences and culinary tours that highlight local ingredients.
- (e) Encourage the development of new accommodations, including hotels, bed and breakfasts, eco-lodges, and campgrounds, to accommodate the influx of visitors attracted by the forest canopy walk. Partner with accommodation providers to offer exclusive packages and deals for visitors.
- (f) Highlight nearby recreational activities and attractions that complement the forest canopy walk experience, such as hiking trails, wildlife viewing areas, and adventure sports. Create partnerships with local recreational providers to offer discounted access and bundled experiences for visitors.
- (g) Advocate for infrastructure improvements, such as road upgrades, parking facilities, and signage, to enhance accessibility and convenience for visitors accessing the forest canopy walk. Work with local authorities and government agencies to secure funding and support for infrastructure projects.
- (h) Establish visitor information centers or kiosks in strategic locations to provide tourists with maps, brochures, and recommendations for local attractions and services. Train staff to provide personalized assistance and answer questions about the forest canopy walk and surrounding area.
- (i) Incorporate cultural and heritage experiences into the tourism offerings surrounding the forest canopy walk. Partner with local cultural institutions, Uganda museums and Tooro museum, and indigenous communities to offer guided tours, workshops, and cultural performances that showcase the Tooro Kingdom's unique heritage.
- (j) Engage with local communities, businesses, and stakeholders to ensure that the benefits of tourism development associated with the forest canopy walk are shared equitably. Foster collaboration and partnerships that support sustainable tourism practices and contribute to the long-term prosperity of the region.

7.7.4 Infrastructure Improvement

Construction projects often involve the development or improvement of infrastructure such as roads, trails, and visitor facilities, which can benefit local communities by enhancing accessibility and quality of life.



Enhancement measures

- (a) Engage local communities in the planning and design phases of infrastructure projects to ensure that their needs and preferences are considered. Hold public meetings, workshops, and surveys to gather input and feedback from residents.
- (b) Prioritize accessibility improvements in infrastructure projects to ensure that facilities are inclusive and accessible to all community members, including those with disabilities and mobility challenges. Install ramps, sidewalks, and crosswalks to enhance pedestrian accessibility.
- (c) Develop multi-modal transportation infrastructure that accommodates various modes of transportation, including walking, cycling, public transit, and private vehicles. Improve connectivity between residential areas, trading centers, and recreational amenities to enhance mobility options for residents.
- (d) Integrate green infrastructure components into construction projects to enhance environmental sustainability and resilience. Incorporate features such as green spaces, rain gardens, and permeable pavement to manage stormwater, reduce urban heat island effects, and improve air quality.
- (e) Use infrastructure projects as an opportunity to enhance community facilities and amenities, such as parks, playgrounds, community centers, and sports facilities. Create vibrant public spaces that promote social interaction, recreation, and cultural activities.
- (f) Leverage infrastructure development to stimulate local economic development and job creation. Prioritize local hiring, procurement, and subcontracting to maximize economic benefits for residents and businesses in the community.
- (g) Enhance tourism and recreation opportunities by improving access to natural and cultural attractions through infrastructure development. Develop trails, interpretive signage, and visitor facilities to encourage tourism and outdoor recreation while preserving the local environment.
- (h) Implement safety and security enhancements in infrastructure projects to create safer and more secure communities. Install street lighting, traffic signals, and surveillance cameras to improve public safety and deter crime in high-risk areas.
- (i) Preserve and celebrate the cultural heritage and historical significance of the community through infrastructure projects. Incorporate design elements and interpretive signage that highlight local history, landmarks, and cultural traditions.
- (j) Develop long-term maintenance and management plans for infrastructure facilities to ensure their continued functionality and sustainability. Allocate resources for routine maintenance, repairs, and upgrades to extend the lifespan of infrastructure assets and minimize future costs.

7.7.5 Community Engagement

The construction phase will involve consultation and collaboration with all stakeholders, specifically providing opportunities for community engagement, capacity building, and participation in decision-making processes.

Enhancement measures

- (a) Host regular workshops and meetings with local communities and other stakeholders to provide updates on the construction project, gather feedback, and address concerns. Create a collaborative environment where community members feel empowered to participate in decision-making processes.
- (b) Provide timely and transparent information about the construction project, including its objectives, timelines, and potential impacts. Make project documents, reports, and plans readily accessible to the public through websites, community meetings, and information centers.
- (c) Provide cultural sensitivity training for project personnel to ensure respectful and inclusive interactions with local communities. Foster understanding and appreciation for local customs, traditions, and cultural protocols throughout the construction process.
- (d) Incorporate traditional knowledge and indigenous perspectives into the planning and implementation of the construction project. Consult with local elders, knowledge holders, and community leaders to identify culturally significant sites, practices, and concerns that should be considered in project design and execution.
- (e) Designate community liaison officers or representatives to serve as points of contact between the construction project team and local communities. These individuals should be familiar with the needs, priorities, and concerns of the community and facilitate communication and collaboration throughout the construction phase.
- (f) Offer capacity building programs and training opportunities for local community members to develop skills and expertise relevant to the construction industry. Provide workshops, apprenticeships, and certification programs in areas such as construction management, safety protocols, and environmental stewardship.
- (g) Prioritize local hiring and procurement in the construction phase to maximize economic benefits for the community. Create job opportunities for local residents in construction-related roles and subcontracting opportunities for local businesses and suppliers.
- (h) Negotiate community benefits agreements that outline specific benefits, investments, and commitments to be provided by the project developer in exchange for community support. Ensure that the agreement addresses the needs and priorities of local communities.
- (i) Establish effective conflict resolution mechanisms to address disagreements or disputes that may arise during the construction phase. Provide avenues for mediation, arbitration, or community dialogue to resolve conflicts in a fair and transparent manner.

7.7.6 Increased Human Presence

The construction phase may bring an influx of workers, equipment, and visitors to the park, leading to increased human disturbance and pressure on fragile ecosystems. **The impact is rated -3 Low.**

Mitigation measures

- (a) Establish designated zones for construction activities to minimize direct impacts on floral and faunal species. Implement access control measures to restrict the movement of construction workers, equipment, and visitors in ecologically sensitive areas.
- (b) Schedule construction activities to minimize impacts e.g. on breeding seasons or migration periods for wildlife. Avoid construction during peak visitor seasons to reduce cumulative impacts on fragile ecosystems.
- (c) Provide training to construction workers on the importance of minimizing their ecological footprint and adhering to site-specific environmental regulations and guidelines. Raise awareness about sensitive faunal species behaviors, and the significance of the protected area.
- (d) Educate visitors about the ecological values of KNP and the importance of minimizing their impact through interpretive signage, guided tours, and visitor orientation programs. Encourage responsible behavior, such as staying on designated trails and respecting wildlife viewing guidelines.
- (e) Implement monitoring programs to assess the effectiveness of mitigation measures and detect any unauthorized activities or disturbances. Enforce regulations and guidelines through regular patrols, surveillance, and fines for non-compliance.
- (f) Engage with stakeholders, including local communities and conservation organizations, to solicit input, build partnerships, and foster stewardship of the protected area. Collaborate on conservation initiatives, community-based monitoring, and sustainable tourism development.
- (g) Implement visitor capacity limits and carrying capacity assessments to prevent overcrowding and minimize ecological impacts from excessive human visitation. Use reservation systems, timed entry permits, or visitor quotas to regulate access during peak periods.

7.7.7 Community Health and Safety Risks

Construction sites pose health and safety risks to workers, visitors, and nearby residents, including accidents, injuries, exposure to hazardous materials, and occupational health hazards. **The impact is rated -3 Low.**

Mitigation measures

- (a) Provide comprehensive safety training programs for all workers, contractors, and subcontractors involved in the construction project. Ensure that workers are trained in hazard recognition, emergency procedures, and safe work practices relevant to their tasks.
- (b) Conduct regular safety inspections of the construction site to identify hazards, assess risks, and implement corrective measures. Inspections should be carried out by trained safety professionals and involve input from workers and supervisors.
- (c) Develop and implement emergency response plans to address accidents, injuries, and other emergencies that may occur on the construction site. Establish procedures for reporting incidents, evacuating workers, and providing medical assistance as needed.

- (d) Implement proper handling, storage, and disposal procedures for hazardous materials commonly used on construction sites, such as chemicals, solvents, and construction waste. Provide training on the safe handling and disposal of hazardous materials to workers and contractors.
- (e) Establish health monitoring and surveillance programs to monitor the health status of workers and detect early signs of occupational illnesses or injuries. Conduct regular medical examinations, screenings, and health assessments for workers exposed to potential hazards.
- (f) Implement noise and dust control measures to minimize exposure to harmful environmental factors on the construction site. Use engineering controls, such as noise barriers and dust suppression systems, to reduce the spread of noise and airborne contaminants.
- (g) Develop traffic management plans to ensure the safe movement of vehicles, equipment, and pedestrians around the construction site. Implement measures such as traffic signs, barriers, and designated pedestrian walkways to prevent accidents and injuries.
- (h) Install clear and visible safety signage throughout the construction site to communicate hazards, warnings, and safety instructions to workers and visitors. Use pictograms, symbols, and multilingual signage to ensure comprehension by all workers.
- (i) Collaborate with regulatory authorities, such as Occupational Health and Safety Department (OSH), to ensure compliance with applicable safety regulations and standards. Participate in safety inspections, audits, and enforcement actions to maintain a safe and healthy work environment.

7.7.8 Effects of social cohesion (distortion of marriages, increased spread of STDs/STIs etc)

Project workers will search for accommodation in different parts of Kabarole district though the nearby Sebitoli village and Kaswa urban center are likely to be points of temporary settlement for the construction team. The positive benefit is that house owners will benefit from renting out properties to workers, however from literature project workers are known to interact with local communities and the interactions end up causing social cohesion. Some of the known effects are early marriages in case project workers exploit underage children, break-up of marriages and increased spread of disease. **The impact is rated -2 moderate.**

- (a) Recruiting project workers from within the project area as a strategy to reduce the influx of people.
- (b) Sensitize project workers against unnecessary interactions and ensuring following cultural norms of the area.
- (c) Support the existing health centres in the project area to enhance the provision of services to unexpected increased population;

7.7.9 Pressure on utilities as a result of an increase in the number of people in the area during construction

There is a possibility of project workers putting pressure on resources and utilities in the project area such as housing, power and water. **The impact is rated -3 low.**

- (a) Project workers should ensure they pay fairly and timely for services consumed.
- (b) Water harvesting may be practiced by workers and community encouraged to do so.

7.8 Operational Phase Impacts (Legal / Regulatory Framework)

7.8.1 Regulatory Compliance

Ensuring ongoing compliance with environmental regulations, zoning ordinances, and other legal requirements during the operation phase can be challenging and may require significant resources for monitoring, reporting, and mitigation measures. **The impact was rated -3 Low.**

Mitigation measures

- (a) Establish a robust compliance management system to monitor, track, and document compliance with environmental regulations, zoning ordinances, and other legal requirements. Implement software tools or databases to centralize compliance data, streamline reporting processes, and facilitate real-time monitoring of regulatory obligations.
- (b) Conduct regular environmental and social audits or assessments to evaluate compliance with applicable regulations, identify potential non-compliance issues, and implement corrective actions. Engage third-party environmental consultants or auditors to provide independent assessments and recommendations for improvement.
- (c) Provide training and capacity building opportunities for staff members responsible for environmental compliance to ensure a thorough understanding of regulatory requirements and best practices. Offer training sessions, workshops, or certification programs on relevant topics such as environmental law, pollution prevention, and regulatory compliance.
- (d) Conduct periodic reviews of legal requirements, permits, approvals, and regulatory obligations to ensure ongoing compliance with environmental regulations, zoning ordinances, and other legal requirements. Stay informed about changes in regulatory frameworks, enforcement priorities, and compliance deadlines that may impact operations.
- (e) Conduct proactive risk assessments to identify potential compliance risks, vulnerabilities, and liabilities associated with environmental regulations and zoning ordinances. Develop risk mitigation strategies and contingency plans to address identified risks and minimize the likelihood of non-compliance.

- (f) Maintain open lines of communication with regulatory authorities responsible for overseeing environmental compliance and zoning enforcement. Proactively engage with regulators to seek guidance on regulatory requirements, address compliance concerns, and resolve any issues or disputes promptly.
- (g) Foster a culture of continuous improvement within the organization to enhance environmental performance, minimize compliance risks, and optimize resource allocation. Establish mechanisms for evaluating and benchmarking environmental performance metrics, setting goals, and implementing corrective actions to drive continual improvement over time.

7.8.2 Public Safety Regulations

Compliance with public safety regulations and liability issues associated with visitor accidents or injuries on the canopy walk, such as inadequate signage, railing heights, or emergency response procedures, can result in legal liabilities and litigation. **The impact was rated -3 Low.**

Mitigation measures

- (a) Conduct a thorough safety assessment of the canopy walk to identify potential hazards, risks, and compliance gaps related to visitor safety regulations. Assess factors such as signage visibility, railing heights, surface conditions, emergency response procedures, and accessibility for visitors with disabilities.
- (b) Implement a schedule for regular inspections and maintenance of the canopy walk infrastructure to ensure compliance with safety regulations and standards. Conduct routine checks of signage, railings, structural integrity, and other safety features to identify and address any deficiencies promptly.
- (c) Develop and implement risk management protocols to mitigate potential hazards and risks associated with visitor accidents or injuries on the canopy walk. Establish procedures for hazard identification, risk assessment, risk mitigation, and incident reporting to proactively manage safety risks.
- (d) Provide comprehensive visitor education and awareness programs to inform visitors about safety guidelines, rules, and procedures for using the canopy walk. Use signage, brochures, orientation sessions, and online resources to communicate safety information effectively and promote responsible behavior.
- (e) Develop and implement emergency response plans and procedures to address potential accidents, injuries, or medical emergencies on the canopy walk. Train staff members and volunteers in emergency response protocols, first aid, CPR, and evacuation procedures to ensure a prompt and effective response to incidents.

- (f) Ensure that the canopy walk is accessible and inclusive for visitors of all ages, abilities, and mobility levels. Comply with accessibility standards and guidelines for barrier-free design, wheelchair access, handrails, signage, and tactile indicators to accommodate diverse visitor needs.
- (g) Obtain liability insurance coverage to protect against potential legal liabilities and litigation arising from visitor accidents or injuries on the canopy walk. Ensure that insurance policies provide adequate coverage for property damage, bodily injury, medical expenses, legal expenses, and other liabilities associated with visitor incidents.
- (h) Conduct regular legal reviews of safety policies, procedures, and liability waivers to ensure compliance with applicable regulations, standards, and best practices. Seek legal counsel to provide guidance on liability issues, risk management strategies, and compliance obligations related to visitor safety on the canopy walk.

7.8.3 Regulatory Changes

Changes in environmental regulations, land use policies, or protected area management plans during the operation phase may require modifications to the operation or closure of the canopy walk, leading to legal compliance issues and potential disputes with regulatory authorities. ***The impact was rated -3 Low.***

Mitigation measures

- (a) Establish a process for regular monitoring and assessment of changes in environmental regulations, land use policies, and protected area management plans that may impact the operation of the canopy walk. Stay informed about new developments, updates, or amendments to relevant regulations and policies.
- (b) Maintain open lines of communication with regulatory authorities responsible for overseeing environmental compliance, land use planning, and protected area management. Proactively engage with regulatory agencies to seek clarification on regulatory requirements, discuss potential impacts on the canopy walk, and explore options for compliance.
- (c) Adopt an adaptive management approach to accommodate changes in environmental regulations and land use policies while ensuring continued operation of the canopy walk. Develop flexibility in operational procedures, management practices, and infrastructure design to adapt to evolving regulatory requirements and minimize compliance risks.
- (d) Conduct risk assessments to identify potential legal compliance issues, regulatory uncertainties, and associated risks arising from changes in environmental regulations or land use policies. Develop contingency plans and mitigation strategies to address potential challenges and ensure timely compliance with regulatory requirements.
- (e) Seek guidance from legal counsel, environmental consultants, or other experts with expertise in environmental law, land use planning, and protected area management. Obtain professional advice

on interpreting regulatory changes, assessing compliance obligations, and developing strategies for addressing legal compliance issues.

- (f) Review and update management plans for the canopy walk in response to changes in environmental regulations, land use policies, or protected area management plans. Ensure that management plans reflect current regulatory requirements, address emerging conservation priorities, and incorporate adaptive management principles.
- (g) Maintain transparency and communication with stakeholders, visitors, and the public regarding changes in environmental regulations, land use policies, or protected area management plans affecting the canopy walk. Provide timely updates, information, and opportunities for stakeholder input to promote understanding and compliance with regulatory requirements.

7.9 Operational Phase Impacts (Biological Environment)

7.9.1 Disturbance to Wildlife

Increased human presence and activity associated with the operation of the canopy walk can disturb wildlife, leading to changes in behavior, habitat avoidance, and stress. Sensitive species may be particularly vulnerable to disturbance. ***The impact is rated -3 Low.***

Mitigation measures

- (a) Develop educational materials and signage to inform visitors about the importance of minimizing disturbance to wildlife. Provide guidelines on appropriate behavior, such as keeping noise levels down, staying on designated paths, and avoiding approaching or feeding wildlife.
- (b) Implement a reservation system or timed entry tickets to control the number of visitors accessing the canopy walk at any given time. This helps prevent overcrowding and reduces the likelihood of wildlife disturbance.
- (c) Establish designated viewing areas along the canopy walk where visitors can observe wildlife without causing disturbance. These areas should be strategically located to minimize visual and auditory impact on sensitive wildlife habitats.
- (d) Designate certain areas along the canopy walk as quiet zones where visitors are encouraged to maintain silence and minimize noise levels. This allows wildlife to remain undisturbed and reduces stress levels, especially for sensitive species.
- (e) Consider implementing seasonal closures during sensitive times such as breeding or nesting seasons to minimize disturbance to wildlife. This allows wildlife to use the area undisturbed during critical life stages.
- (f) Provide training for canopy walk staff on wildlife conservation and interpretation techniques. Staff should be knowledgeable about local wildlife species, their habitats, and how to minimize disturbance while interacting with visitors.

- (g) Offer interpretive programs and guided tours focused on wildlife conservation and habitat protection. Educate visitors about the importance of respecting wildlife and minimizing their impact on natural ecosystems.

7.9.2 Introduction of Exotic Species

Visitors to the canopy walk may inadvertently introduce non-native plant seeds, insects, or pathogens to the protected area, potentially leading to competition with native species, habitat degradation, and altered ecosystem dynamics. **The impact is rated -3 Low.**

Mitigation measures

- (a) Develop educational materials and signage to inform visitors about the importance of preventing the introduction of non-native species. Provide guidelines on proper cleaning of footwear and clothing before entering the protected area and encourage visitors to check for seeds or insects.
- (b) Install boot cleaning stations at the entrance to the canopy walk where visitors can brush off dirt, seeds, and insects from their footwear before entering the protected area. Provide brushes, water, and cleaning solutions for visitors to use.
- (c) Place signage at trailheads and entrance points to the canopy walk that highlights the importance of preventing the spread of invasive species. Provide information on how visitors can help by cleaning their gear and staying on designated paths.
- (d) Implement a monitoring program to regularly assess the presence of invasive species within the protected area. Train staff and volunteers to identify invasive plants, insects, and pathogens and report any findings for prompt management action.
- (e) Conduct native plant restoration efforts within the protected area to restore habitat and outcompete invasive species. Engage volunteers and local community groups in planting native vegetation and removing invasive plants.
- (f) Implement regular site maintenance activities such as trail grooming and vegetation management to control the spread of invasive species and prevent their establishment within the park.
- (g) Develop and enforce biosecurity protocols for staff, contractors, and researchers working within the park. Require adherence to strict cleaning and disinfection procedures for equipment and vehicles to prevent the spread of invasive species.

7.9.3 Spread of Invasive Species

Operation of the canopy walk may facilitate the spread of invasive plant species by providing pathways for their dispersal and colonization into previously undisturbed areas. Invasive species can outcompete native vegetation and disrupt ecosystem functioning. **The impact is rated -1 High.**

Mitigation measures

	225

- (a) Install signage at entry points to the canopy walk advising visitors not to bring in any plants, seeds, or plant parts from outside the area. Provide information on the importance of preventing the spread of invasive species and how visitors can help.
- (b) Establish boot cleaning stations at the entrance to the canopy walk where visitors can brush off dirt and seeds from their footwear before entering the area. Provide brushes, water, and cleaning solutions for visitors to use.
- (c) Implement regular trail maintenance activities to remove any invasive plants that may be present along the canopy walk. Train staff and volunteers to identify invasive species and report any sightings for prompt management action.
- (d) Develop and implement invasive species removal programs to target and control the spread of invasive plants within and adjacent to the canopy walk area. Utilize manual removal, mechanical control methods, and targeted herbicide application as appropriate.
- (e) Conduct native plant restoration efforts within and around the canopy walk area to restore habitat and outcompete invasive species. Engage volunteers and local community groups in planting native vegetation and removing invasive plants.
- (f) Install physical barriers such as fencing or barriers made from natural materials to prevent the spread of invasive plants from adjacent areas into the canopy walk area. Regularly inspect and maintain these barriers to ensure effectiveness.
- (g) Implement an early detection and rapid response program to identify and address new invasive species infestations in the vicinity of the canopy walk area. Develop protocols for quickly responding to new invasive species sightings to prevent their establishment and spread.
- (h) Provide educational materials and programs to raise awareness among visitors, staff, and local communities about the threat of invasive species and how they can help prevent their spread. Offer guided walks or interpretive programs focused on invasive species management.
- (i) Partner with local conservation organizations, invasive species experts, and government agencies to develop and implement effective invasive species management strategies. Seek advice and expertise on species identification, control methods, and monitoring techniques.
- (j) Conduct regular monitoring of the canopy walk area and surrounding habitats to assess the effectiveness of invasive species management efforts. Monitor changes in vegetation composition and diversity over time and adjust management strategies as needed.

7.9.4 Accidental wildlife disturbance

Activities associated with the operation of the canopy walk, such as maintenance work, guided tours, or recreational activities, may inadvertently disturb nesting sites, foraging areas, or breeding grounds of wildlife, leading to negative impacts on population dynamics and reproductive success. **The impact is rated -3 Low.**

Mitigation measures

	226

- (a) Implement seasonal restrictions on certain activities, such as maintenance work or guided tours, during critical wildlife breeding or nesting seasons. Adjust schedules to minimize disturbance during sensitive times.
- (b) Conduct thorough surveys to identify and map sensitive wildlife habitats, including nesting sites, foraging areas, and breeding grounds. Use this information to inform activity planning and avoid sensitive areas whenever possible.
- (c) Design and maintain trails and access routes to minimize impacts on wildlife habitat. Use existing pathways and avoid creating new trails through sensitive areas whenever possible.
- (d) Develop protocols for guided tours to minimize disturbance to wildlife. Train guides to recognize signs of wildlife activity and adjust routes or activities accordingly to avoid nesting or breeding areas.
- (e) Provide educational materials and interpretive signage to inform visitors about the importance of minimizing disturbance to wildlife. Encourage visitors to stay on designated paths, keep noise levels down, and avoid approaching wildlife.
- (f) Limit access to sensitive wildlife habitats by controlling visitor numbers and restricting entry during critical periods, such as breeding seasons. Implement reservation systems or timed entry tickets to manage visitor flow.
- (g) Implement a monitoring program to assess the effects of canopy walk activities on wildlife populations and habitat use. Conduct research to identify sensitive species and their specific responses to disturbance.
- (h) Implement habitat enhancement measures, such as planting native vegetation or installing nest boxes, to offset any habitat loss or disturbance caused by canopy walk activities. Create alternative nesting or foraging opportunities for wildlife.

7.9.5 Altered Predator-Prey Dynamics

Increased human presence in the protected area may alter predator-prey dynamics, leading to changes in species interactions and ecosystem structure. Predators may avoid areas of high human activity, while prey species may experience increased predation risk due to reduced vigilance. **The impact is rated -3 Low.**

Mitigation measures

- (a) Maintain and enhance natural habitats within the protected area to provide refuge and suitable habitat for both predator and prey species. Ensure a diverse habitat structure to support a variety of species.
- (b) Implement vegetation screening or strategic placement of vegetation to create visual barriers that help prey species detect and evade predators. This can help mitigate the increased predation risk associated with reduced vigilance.
- (c) Design trails and access routes in a way that minimizes disruption to predator-prey interactions. Avoid creating trails that intersect key predator hunting grounds or disrupt prey movement corridors.

- (d) Provide educational materials and interpretive signage to inform visitors about the importance of minimizing disturbance to predator-prey dynamics. Encourage visitors to stay on designated trails, keep noise levels down, and avoid behaviors that may disrupt wildlife behavior.
- (e) Implement targeted predator management strategies, such as habitat restoration or predator deterrents, to mitigate the potential impacts of increased human presence on predator populations. Ensure that management actions are based on scientific evidence and conducted in a humane and ethical manner.
- (f) Implement measures to protect vulnerable prey species from increased predation risk associated with reduced vigilance. This may include providing artificial refuges, such as nest boxes or hiding places, and enhancing habitat features that improve prey detection and escape.
- (g) Establish monitoring programs to assess changes in predator and prey populations, behavior, and interactions in response to increased human presence. Use this information to inform adaptive management strategies and adjust conservation efforts as needed.
- (h) Implement seasonal restrictions on certain human activities, such as hiking or recreational events, during sensitive periods for predator-prey dynamics. Adjust visitor access and activity levels to minimize disruption to wildlife behavior during critical times.
- (i) Conduct research to better understand the specific impacts of increased human presence on predator-prey dynamics in the protected area. Collaborate with researchers, conservation organizations, and local stakeholders to develop and implement effective management strategies.

7.9.6 Loss of Nesting Sites

Continued use of the canopy walk and surrounding infrastructure may lead to the loss or degradation of nesting sites for birds and other wildlife. This loss can negatively impact reproductive success and population viability for species that rely on specific habitat features for nesting. **The impact is rated -3 Low.**

Mitigation measures

- (a) Conduct regular habitat assessments to identify nesting sites and critical habitat features for birds and other wildlife within the area surrounding the canopy walk. Implement monitoring programs to track changes in habitat quality and nesting site availability over time.
- (b) Designate nesting sites and critical habitat features as protected areas where human disturbance is minimized or prohibited. Install signage and barriers to demarcate these areas and prevent inadvertent disturbance by visitors.
- (c) Implement habitat restoration and enhancement projects to create or improve nesting habitat for birds and other wildlife. This may include planting native vegetation, installing nest boxes or platforms, and creating artificial nesting structures.

- (d) Implement vegetation management practices that promote the growth and maintenance of suitable nesting habitat while minimizing the risk of habitat degradation. Use selective pruning and thinning techniques to maintain habitat structure and diversity.
- (e) Provide educational materials and interpretive signage to raise awareness among visitors about the importance of nesting habitat for birds and other wildlife. Encourage visitors to respect nesting sites and avoid activities that may disturb nesting individuals or their offspring.
- (f) Implement seasonal restrictions on certain activities, such as vegetation maintenance or infrastructure development, during critical nesting periods for birds and other wildlife. Adjust visitor access to minimize disturbance during sensitive times.
- (g) Conduct regular maintenance inspections of infrastructure surrounding the canopy walk to identify and address potential nesting site impacts. Repair or replace damaged structures to prevent further habitat degradation.

7.9.7 Spread of Diseases

Concentrated human visitation to the canopy walk can increase the risk of disease transmission among wildlife populations, particularly if visitors come into close contact with infected animals or their habitats. Disease outbreaks can have significant impacts on population health and dynamics. ***The impact is rated -2 Moderate.***

Mitigation measures

- (a) Protection against spread of diseases should follow UWA/national policies and guidelines.
- (b) Provide educational materials and signage to inform visitors about the potential risks of disease transmission to wildlife and the importance of minimizing contact with wildlife and their habitats. Encourage visitors to maintain a safe distance from wildlife and to follow recommended hygiene practices.
- (c) Install hand hygiene stations at key entry points to the canopy walk and along visitor routes. Provide hand sanitizer or handwashing facilities to encourage visitors to clean their hands before and after interacting with wildlife or their habitats.
- (d) Implement visitor monitoring programs to track visitor behavior and compliance with guidelines related to wildlife interaction and disease prevention. Use this information to identify areas of concern and implement targeted interventions as needed.
- (e) Establish wildlife health surveillance programs to monitor for signs of disease outbreaks among wildlife populations in the canopy walk area. Collaborate with wildlife health experts and local agencies to conduct regular monitoring and respond promptly to any detected disease threats.
- (f) Develop and implement biosecurity protocols for staff and volunteers working in the canopy walk area. Require adherence to strict hygiene practices and provide training on how to minimize the risk of disease transmission between wildlife and humans.

- (g) Conduct regular habitat monitoring to assess the health and resilience of wildlife habitat within the canopy walk vicinity. Identify and address any habitat degradation or disturbance that may increase the risk of disease transmission among wildlife populations.
- (h) Develop disease management plans that outline procedures for responding to disease outbreaks among wildlife populations in the canopy walk area. Establish protocols for monitoring, reporting, and managing disease incidents in collaboration with relevant stakeholders.
- (i) Collaborate with public health authorities to stay informed about potential disease risks and outbreaks that may affect wildlife populations in the canopy walk area. Share information and coordinate response efforts to protect both wildlife and human health.

7.9.8 **Altered Plant-Animal Interactions**

Increased visitation to the canopy walk may lead to changes in plant-animal interactions, such as pollination and seed dispersal. Disruption of these interactions can affect plant reproduction, population dynamics, and overall ecosystem resilience. **The impact is rated -3 Low.**

Mitigation measures

- (a) Provide educational materials and interpretive signage to inform visitors about the importance of plant-animal interactions in maintaining ecosystem health and resilience. Encourage visitors to respect natural processes and avoid behaviors that may disrupt these interactions, such as picking flowers or disturbing wildlife.
- (b) Establish designated viewing areas along the canopy walk where visitors can observe plant-animal interactions without directly interfering with them. Design these areas to minimize disturbance to wildlife and vegetation.
- (c) Develop visitor guidelines that outline appropriate behavior while visiting the canopy walk, including guidelines for interacting with plants and wildlife. Emphasize the importance of staying on designated paths, refraining from touching or disturbing plants, and avoiding feeding wildlife.
- (d) Design trails and visitor routes to minimize trampling and disturbance of vegetation. Use boardwalks, elevated walkways, or gravel paths to direct visitor traffic and protect sensitive plant communities from damage.
- (e) Implement visitor monitoring programs to track visitor behavior and compliance with guidelines related to plant-animal interactions. Use this information to identify areas of concern and implement targeted interventions as needed.
- (f) Implement habitat restoration projects to enhance plant-animal interactions and promote ecosystem resilience. Restore degraded habitat areas, replant native vegetation, and create habitat features that support pollinators and seed dispersers.

- (g) Implement seasonal restrictions on certain activities, such as flower picking or fruit harvesting, during critical periods for plant reproduction and seed dispersal. Adjust visitor access and activity levels to minimize disruption during sensitive times.
- (h) Conduct research to better understand the effects of increased visitation on plant-animal interactions in the canopy walk area. Monitor changes in plant reproductive success, seed dispersal patterns, and pollinator abundance to assess the effectiveness of mitigation measures.
- (i) Collaborate with conservation organizations, botanical gardens, and research institutions to develop and implement effective management strategies for protecting plant-animal interactions in the canopy walk area. Share knowledge, resources, and expertise to support conservation efforts.

7.10 Operational Phase Impacts (Physical Environment)

7.10.1 Structural Degradation

Continuous use of the canopy walk can lead to wear and tear, resulting in structural degradation over time. This may necessitate regular maintenance and repair activities, which can further disturb the surrounding environment. **The impact is rated -2 Moderate.**

Mitigation measures

- (a) Establish a routine inspection and maintenance schedule for the canopy walk to identify and address signs of wear and tear proactively. Conduct regular inspections of structural components, decking, handrails, and support systems to detect any issues early.
- (b) Use durable materials resistant to weathering effects from sun and rain and when constructing or refurbishing the canopy walk, UWA should select materials such as treated wood, corrosion-resistant metals of high-quality to prolong the lifespan of the structure and reduce the frequency of maintenance. Good quality durable material should also be safe to walk on in the different seasons.
- (c) Coordinate maintenance activities to coincide with periods of lower visitor traffic or seasonal closures to minimize disruption to canopy walk users and surrounding wildlife. Plan maintenance shutdowns during off-peak hours or during the offseason to reduce inconvenience.
- (d) Implement access management protocols to control visitor access to sections of the canopy walk undergoing maintenance or repair. Erect signage, barricades, or temporary closures to inform visitors of restricted areas and redirect foot traffic away from work zones.
- (e) Utilize low-impact maintenance techniques and equipment to minimize disturbance to the surrounding environment during repair activities. Use hand tools or lightweight machinery where possible to reduce soil compaction, vegetation damage, and noise pollution.
- (f) Incorporate sustainable materials and practices into maintenance and repair activities to minimize environmental impact. Use eco-friendly cleaning products, adhesives, and coatings that are non-toxic and biodegradable to reduce pollution and protect wildlife.

- (g) Implement erosion and sediment control measures around maintenance work zones to prevent soil erosion and runoff into nearby water bodies. Install silt fencing, erosion control blankets, or vegetative buffers to contain sediment and minimize impacts on aquatic habitats.
- (h) Restore and rehabilitate any areas affected by maintenance or repair activities to mitigate ecological disturbances. Replant native vegetation, stabilize soils, and restore wildlife habitat to promote ecosystem recovery and resilience.
- (i) Communicate with canopy walk users and nearby communities about planned maintenance and repair activities in advance. Provide updates through signage, websites, social media, or visitor centers to inform visitors of any temporary closures or alternative routes.
- (j) Monitor the effectiveness of maintenance and repair activities and their impacts on the surrounding environment over time. Collect data on a daily basis on canopy walk condition, visitor satisfaction, and ecological indicators to inform adaptive management and improvement efforts.

7.10.2 Noise Pollution

Operation of the canopy walk, including visitor chatter, footsteps, and associated activities, can contribute to noise pollution in the protected area. Excessive noise can disturb wildlife, disrupt natural behaviors, and detract from the visitor experience. **The impact is rated -3 Low.**

Mitigation measures

- (a) Educate visitors about the importance of minimizing noise and maintaining a respectful atmosphere while using the canopy walk. Provide information through signage, interpretive materials, and guided tours on the potential impacts of noise pollution on wildlife and the natural environment.
- (b) Establish quiet hours or periods of reduced activity during which visitors are encouraged to minimize noise levels and engage in quiet observation. Develop guidelines for appropriate behavior on the canopy walk, including speaking in hushed tones and avoiding loud or disruptive activities.
- (c) Implement visitor capacity limits and timed entry systems to prevent overcrowding on the canopy walk and minimize noise congestion. Use reservation systems or ticketing mechanisms to regulate the number of visitors allowed on the walkway at any given time.
- (d) Manage visitor groups to limit the size and spacing of groups using the canopy walk simultaneously. Encourage smaller, more intimate tours or staggered entry times to reduce the cumulative noise generated by multiple groups.
- (e) Design the canopy walk with noise mitigation in mind, incorporating sound-absorbing materials, strategic placement of barriers, and acoustic baffles to minimize noise propagation. Consider the orientation and layout of viewing platforms to minimize sound transmission to sensitive areas.
- (f) Offer interpretive programs and guided tours focused on nature appreciation and quiet observation to encourage visitors to engage with the environment in a peaceful and contemplative manner.

Provide opportunities for sensory experiences, such as birdwatching or listening to natural sounds, to foster appreciation for the natural world without disturbing wildlife.

- (g) Maintain the canopy walk infrastructure, including decking, handrails, and viewing platforms, to minimize noise generated by creaking or rattling components. Conduct regular inspections and repairs to address any sources of unwanted noise and ensure a smooth, quiet visitor experience.
- (h) Establish buffer zones or setbacks between the canopy walk and sensitive wildlife habitats to reduce the transmission of noise from visitor activities. Preserve natural vegetation and topographic features to serve as acoustic barriers and provide refuge for wildlife.
- (i) Monitor noise levels on the canopy walk and surrounding areas to assess compliance with noise guidelines and regulations. Enforce noise ordinances and visitor behavior policies through education, signage, and staff presence to maintain a peaceful environment for wildlife and visitors.

7.10.3 Visual Impact

The presence of the canopy walk structure and associated infrastructure (e.g., signage, viewing platforms) can alter the visual aesthetics of the landscape, potentially diminishing its natural beauty and scenic value.

The impact is rated -2 Moderate.

Mitigation measures

- (a) Design the canopy walk structure and associated infrastructure with sensitivity to the surrounding forest landscape's natural features and visual character. Consider the topography, vegetation, and views when siting the walkway, viewing platforms, and interpretive signage to minimize visual intrusion.
- (b) Opt for a low-profile and unobtrusive design for the canopy walk structure, using lightweight materials, slender support columns, and minimalistic architecture to blend harmoniously with the natural surroundings. Keep structures below the tree canopy or incorporate elements that mimic tree forms to reduce visual prominence.
- (c) Use natural materials and earth-toned colors for the construction of the canopy walk and associated infrastructure to help them blend seamlessly with the landscape. Choose materials that complement the surrounding vegetation and geological features to minimize contrast and visual disturbance.
- (d) Utilize existing vegetation or strategically plant native trees, to screen and buffer the canopy walk structure from prominent viewpoints or sensitive visual receptors. Create visual breaks or focal points along the walkway to frame scenic views and enhance the overall aesthetic experience.
- (e) Conduct a viewshed analysis to assess the visual impact of the canopy walk from key vantage points and viewpoints within the landscape. Use this information to inform siting decisions, design modifications, and vegetation management strategies to mitigate visual intrusion and preserve scenic views.

- (f) Implement seasonal vegetation management practices to maintain sightlines and preserve scenic views without compromising ecological integrity. Trim or selectively prune vegetation to enhance visibility of the canopy walk during peak visitor seasons while allowing for natural regrowth and succession.
- (g) Conduct a visual impact assessment as part of the planning and permitting process to evaluate the potential visual effects of the canopy walk on the landscape. Use the assessment findings to identify mitigation measures, design alternatives, or visual enhancements that minimize adverse impacts and enhance visual quality.
- (h) Communicate with visitors and the broader community about the purpose, design rationale, and ecological significance of the KNP canopy walk through interpretive signage, guided tours, and public outreach events. Foster appreciation for the landscape's unique beauty and scenic values while promoting stewardship and responsible visitation.

7.10.4 Impacts associated with increased human presence

Continuous operation of the canopy walk may attract a steady stream of visitors to the protected area, leading to increased human presence and associated impacts such as littering, vandalism, and disturbance to wildlife. **The impact is rated -3 Low.**

Mitigation measures

- (a) Provide educational materials, signage, and interpretive programs to inform visitors about the importance of responsible behavior and the potential impacts of their actions on the environment. Emphasize principles of “**Leave No Trace**” and encourage respect for wildlife and their habitats.
- (b) Implement visitor management strategies such as timed entry systems, visitor quotas, or reservation requirements to regulate the flow of visitors and prevent overcrowding on the forest canopy walk. Use signage and online booking systems to communicate availability and encourage staggered visitation.
- (c) Design the canopy walk and associated facilities with durability and resilience in mind to withstand continuous use and minimize maintenance requirements. Use sturdy materials, vandal-resistant features, and proactive maintenance practices to deter vandalism and ensure infrastructure integrity.
- (d) Install trash receptacles, recycling bins, and waste collection points along the forest canopy walk route to encourage proper disposal of litter and recyclables. Implement regular litter patrols and cleanup efforts to maintain cleanliness and prevent accumulation of debris.
- (e) Utilize visitor monitoring techniques such as trail counters, surveillance solar powered cameras, or visitor surveys to assess visitor use patterns and identify areas of concern. Use this data to inform management decisions and target outreach efforts to address specific visitor behavior issues.
- (f) Recruit volunteers and citizen scientists to assist with monitoring, education, and stewardship efforts related to the forest canopy walk and surrounding area. Engage volunteers in litter cleanups, wildlife

monitoring, and visitor outreach to foster a sense of ownership and responsibility among the community.

- (g) Increase law enforcement presence and patrols in the protected area to deter illegal activities such as vandalism, theft, or wildlife harassment. Collaborate with local law enforcement agencies to enforce regulations and respond to visitor incidents effectively.
- (h) Offer interpretive programs, guided tours, and ranger-led activities to enhance visitor experiences and foster appreciation for the natural and cultural values of the protected area. Use guided tours as opportunities to educate visitors about responsible behavior and conservation principles.
- (i) Forge partnerships with local communities, businesses, and conservation organizations to promote responsible visitation and support sustainable tourism practices. Involve stakeholders in decision-making processes and leverage community resources for outreach, education, and infrastructure improvements.
- (j) Adopt an adaptive management approach to monitor visitor impacts, evaluate the effectiveness of mitigation measures, and adjust management strategies as needed. Regularly review visitor use data, feedback from stakeholders, and emerging trends to inform decision-making and improve visitor management practices.

7.10.5 Risk of Accidents

The Canopy walk will reach a maximum of 16m off the ground depending on the ground where the different columns will be established, the walk way will hang on the columns, generally the fact that the facility will be raised meters off the ground and is to be established in a wildlife zone, the potential of accidents or incidents needs to be discussed and mitigation measures proposed for implementation.

Accidents or incidents involving visitors on the canopy walk can occur, posing risks to both human safety and the surrounding environment. The operation of a canopy walk in a forested national park comes with a number of risks, arising from the presence of wildlife, invasive plant species and pests, as well as from various construction-related and environmental hazards. For example, invasive plant species can grow on canopy walk structures, potentially compromising their structural integrity. Roots and vines can penetrate cracks in the decked wood, causing wear and tear. Insects or other pests might infest the wooden or metal parts of the canopy walk, leading to damage that weakens the structure and creates safety hazards. Additionally, leaves, seeds, and other debris from invasive plants can accumulate on the walkway, creating slip hazards. Over time, materials used in construction can degrade or fail if not properly maintained, posing risks to visitor safety. Allowing more visitors than the canopy walk is designed to handle can stress the structure, increasing the risk of accidents. Overcrowding can lead to panic situations, where people might push or shove, resulting in falls or other injuries. Severe cold weather can make the canopy walk slippery or even cause structural damage, posing a risk to visitors. Elevated structures like canopy walks are particularly hazardous during thunderstorms.

As part of design, for tourists, the design of the canopy walk provides inclusive opportunities, accommodating people with disabilities, whether or not they use a wheelchair. The railing has been designed at a height of 1.1 meters, with intermediate bars measuring 16mm in diameter and fitted with 40x40mm chain links. The rail design has also been proposed to minimize likely risks of falling from the canopy walk.

The proposed structural design of the canopy is robust and resilient, capable of supporting considerable weight, such as that of an elephant, (in reference to the fear of likely collapse of the walkway due to weight). Still on the safety of tourists, the canopy walk floor shall be made with material that is not easily affected (slippery/ susceptible to mold growth), hence ensuring protection of the users.

It has been proposed that management shall ensure no presence of animals on the canopy walk before tourists utilise the canopy walk. With the above design proposals, ***the impact is still rated -1 High, but will become moderate with implementation of mitigation measures.***

Mitigation measures

- (a) Put in place assembly point to be used to record data for the persons to be on board and upon return from the canopy walk guided tour.
- (b) Establish and enforce safety guidelines and regulations for visitors and any other individuals using the forest canopy walk, including age restrictions, weight limits, and behavioral expectations. Clearly communicate safety rules through signage, orientation sessions, and informational materials that should be carried along with during the tours.
- (c) Provide comprehensive visitor orientation sessions or safety briefings before accessing the canopy walk to familiarize visitors with potential hazards, emergency procedures, and response and safety equipment. Offer educational materials on proper behavior and risk awareness to enhance visitor preparedness.
- (d) Install safety equipment and infrastructure such as hang points, handrails, guardrails, non-slip surfaces, and emergency call boxes along the canopy walk route to minimize the risk of accidents and facilitate emergency response. Regularly inspect and maintain safety features to ensure their effectiveness.
- (e) Develop and implement emergency preparedness and response protocols tailored to the unique challenges of the canopy walk environment in consideration of various wet and dry seasons. Train staff and volunteers in first aid, CPR, and emergency evacuation procedures, and establish communication channels for rapid response coordination.
- (f) Provide specialized training for staff responsible for monitoring and supervising visitor activities on the canopy walk. Equip staff with the necessary skills and resources to identify potential risk, safety hazards, enforce regulations, and respond effectively to emergencies.
- (g) Utilize surveillance installed cameras data, remote sensors, or visitor counters to monitor visitor activity on the canopy walk and detect potential safety concerns in real-time. Implement regular patrols or monitoring routines to ensure compliance with safety guidelines and regulations.

- (h) Implement visitor registration or check-in procedures to track the number of visitors using the canopy walk and facilitate accountability in the event of an emergency. Use visitor data to manage capacity, assess risk levels, and optimize safety measures.
- (i) Install reliable communication systems such as two-way radios, emergency phones, or satellite phones along the canopy walk route to enable prompt communication between visitors, staff, and emergency responders during critical situations.
- (j) Establish partnerships with local emergency services, including fire departments, search and rescue teams, and medical facilities, to coordinate emergency response efforts and facilitate timely assistance in case of accidents or incidents on the canopy walk.
- (k) Conduct thorough post-incident reviews and debriefings following accidents or incidents on the canopy walk to identify lessons learned, root causes, and opportunities for improvement in safety protocols and infrastructure. Implement corrective actions and preventative measures to minimize future risks.

7.10.6 Resource Consumption

Operation of the canopy walk requires ongoing resource consumption, including energy for lighting, maintenance equipment, and visitor amenities. This consumption can contribute to environmental degradation and carbon emissions. **The impact is rated -2 Moderate.**

Mitigation measures

- (a) Implement a system to monitor energy consumption and carbon emissions associated with the canopy walk regularly. Use this data to track progress, identify areas for improvement, and report on environmental performance transparently.

7.10.7 Generation of solid waste

Increased visitor numbers can result in greater generation of waste, including human waste, litter, food packaging, and disposable items. Improper waste management practices can lead to pollution of the protected area, affecting both terrestrial and aquatic ecosystems, as well as human health. **The impact is rated -3 Low.**

Mitigation measures

- (a) Encourage visitors to minimize waste generation by promoting reusable items.
- (b) Develop educational materials and signage to raise awareness among visitors about the importance of waste reduction and proper waste disposal practices. Emphasize the impact of litter on the environment and wildlife.
- (c) Ensure adequate sanitary facilities are in place and kept clean daily.

- (d) Install sufficient waste bins and recycling containers throughout the area, including at entry points, rest areas, and popular viewpoints. Clearly label bins to facilitate proper waste sorting by visitors.
- (e) Implement a schedule for frequent waste collection to prevent overflow and littering. Assign staff or volunteers to regularly patrol the area and pick up any litter.
- (f) Establish composting facilities for organic waste generated within the area, such as food scraps and biodegradable materials. Use composted materials for landscaping or other beneficial purposes.
- (g) Monitor waste management practices regularly and enforce regulations regarding littering and improper waste disposal. Implement fines or penalties for offenders to deter irresponsible behavior.
- (h) Organize volunteer cleanup events and encourage visitor participation in conservation activities. Provide incentives such as discounts or rewards for those who actively contribute to waste reduction efforts.

7.10.8 Introduction of exotic species

Visitors to the canopy walk may unintentionally introduce exotic plant seeds, insects, or pathogens to the protected area, potentially disrupting native ecosystems and biodiversity. **The impact is rated -1 High.**

Mitigation measures

- (a) Develop educational materials and signage to inform visitors about the importance of preventing the spread of invasive species and pathogens. Provide information on the potential impacts of introducing non-native species to the forest ecosystem and encourage responsible behavior.
- (b) Provide information to visitors before their arrival, such as on your website or through email communications, about the need to clean their clothing, footwear, and gear to remove seeds, insects, and pathogens before entering the protected area.
- (c) Establish designated entry points where visitors can undergo inspections or cleaning procedures to remove seeds, insects, and pathogens from their clothing, footwear, and gear before accessing the canopy walk. Provide facilities such as boot brushes, cleaning stations, or footwear disinfection mats.
- (d) Train staff members to identify potential sources of invasive species and pathogens and to educate visitors about the importance of preventing their introduction to KNP area. Staff should also be knowledgeable about local regulations regarding the transport of plants, animals, and other materials.
- (e) Implement regular monitoring and surveillance programs to detect any signs of invasive species or pathogens in the protected area. Encourage visitors to report any sightings of unfamiliar plants, insects, or signs of disease.
- (f) Establish quarantine protocols for incoming plants, soil, or other materials brought into the protected area for research, landscaping, or other purposes. Inspect and treat incoming materials to prevent the introduction of invasive species or pathogens.

7.10.9 Conflict with Wildlife

Operation of the canopy walk may lead to increased interaction between visitors and wildlife, and wildlife and local community potentially causing stress or disturbance to sensitive species. This interaction can also pose safety risks to both visitors and wildlife. There is also a potential of the product becoming massive hence affecting the ecosystem and leading to migration of some animals. **The impact is rated -2 Moderate.**

Mitigation measures

- (a) Develop and communicate clear guidelines to visitors regarding wildlife viewing etiquette and behavior. Provide information on maintaining a safe distance from wildlife, avoiding feeding or approaching animals, and minimizing noise and disturbance.
- (b) Install signage along the canopy walk and at entry points to educate visitors about the importance of respecting wildlife and their natural behaviors. Provide interpretation materials that highlight the significance of local wildlife species and their habitats.
- (c) Establish designated viewing areas along the canopy walk where visitors can safely observe wildlife from a distance without causing disturbance. Use viewing platforms or strategically placed observation points to minimize direct contact with sensitive habitats.
- (d) Implement time restrictions or visitor quotas during peak wildlife activity periods to reduce the likelihood of overcrowding and disturbance. Schedule guided tours or educational programs led by trained naturalists to facilitate responsible wildlife viewing.
- (e) Conduct regular monitoring of wildlife populations and behavior patterns to identify any signs of stress or disturbance. Implement adaptive management strategies, such as adjusting visitor access or activity levels, to minimize negative impacts on sensitive species.
- (f) Provide training for staff members or volunteers responsible for managing visitor interactions with wildlife. Equip them with the knowledge and skills to respond appropriately to wildlife sightings, enforce guidelines, and ensure visitor safety.
- (g) Encourage visitors to provide feedback on their wildlife viewing experiences and any observations of wildlife behavior. Use this feedback to refine management strategies and improve visitor education efforts over time.

7.11 Operational Phase Impacts (Socio-Economic Environment)

7.11.1 Tourism Revenue

The canopy walk can attract tourists, leading to increased spending on accommodations, restaurants, transportation, and souvenirs in the local community. This boosts the economy and creates job opportunities in tourism-related sectors. The influx of visitors to the canopy walk provides opportunities for cultural exchange as well as interaction between tourists and local communities, fostering understanding, appreciation, and preservation of indigenous cultures and traditions.

Enhancement measures

- (a) Launch targeted marketing campaigns to promote the canopy walk as a premier tourist attraction in the region. Collaborate with the UTB, local tourism boards, travel agencies, and online platforms to increase visibility and attract visitors from diverse geographic markets.
- (b) Partner with local accommodations, restaurants, transportation providers, and tour operators to create package deals and bundled experiences that include access to the canopy walk. Offer discounts, special offers, and added-value incentives to attract tourists and encourage longer stays.
- (c) Advocate for investments in tourism infrastructure improvements that enhance visitor experiences and support increased visitation to the area. This may include upgrades to roads, parking facilities, signage, and visitor amenities near the canopy walk.
- (d) Establish visitor information centers or kiosks near the canopy walk entrance to provide tourists with maps, brochures, and personalized recommendations for local attractions, activities, and services. Staff these centers with knowledgeable locals who can offer insider tips and insights.
- (e) Promote local culinary experiences and gastronomic tourism opportunities that showcase the region's unique flavors and culinary traditions. Encourage visitors to dine at local restaurants, cafes, and food stalls offering authentic dishes made with locally sourced ingredients.
- (f) Organize artisan markets, craft fairs, and cultural festivals that highlight local artisans, craftsmen, and cultural heritage. Provide opportunities for visitors to purchase handmade souvenirs, artworks, and locally crafted goods as mementos of their visit.
- (g) Develop community-led tours and immersive experiences that offer visitors a glimpse into the daily life, culture, and traditions of local residents. Offer guided tours of nearby villages, cultural heritage sites, and artisan workshops led by knowledgeable locals.
- (h) Emphasize sustainable tourism practices and responsible travel initiatives that minimize negative impacts on the environment, culture, and local communities. Encourage visitors to support businesses that prioritize sustainability and ethical tourism practices.
- (i) Explore opportunities to diversify the tourism offerings in the area beyond the canopy walk, such as adventure tourism activities, ecotourism experiences, cultural immersion programs, and agri-tourism initiatives. Develop new attractions and experiences that appeal to a wider range of interests and preferences.
- (j) Invite members of local communities to demonstrate traditional arts and crafts techniques, such as weaving, pottery, basketry, or carving, to visitors. Offer interactive workshops where visitors can learn hands-on skills from skilled artisans.
- (k) Organize regular cultural performances featuring traditional music, dance, storytelling, and theater by local indigenous performers. Host cultural festivals or events that celebrate indigenous heritage and provide opportunities for visitors to engage with local artists and performers.

- (l) Offer guided cultural tours led by members of local communities, providing insights into traditional knowledge, customs, and practices. Allow visitors to visit sacred sites, ancestral lands, and community landmarks while learning about their cultural significance.
- (m) Introduce visitors to traditional cuisine through food tastings, cooking demonstrations, and farm-to-table experiences. Partner with local restaurants, food vendors, and community kitchens to showcase regional specialties and promote sustainable food practices.
- (n) Host language workshops and immersion experiences to teach visitors basic phrases and greetings in the languages spoken by local indigenous communities. Provide opportunities for cultural exchange and language practice through guided conversations and storytelling sessions.
- (o) Develop cultural heritage trails or interpretive routes that highlight important cultural landmarks, historical sites, and traditional gathering places. Install interpretive signage along the trails to provide context and information about the significance of each site.
- (p) Facilitate community homestay programs that allow visitors to stay with local indigenous families and experience daily life in the community firsthand. Encourage cultural exchange through shared meals, storytelling sessions, and participation in community activities.
- (q) Create artisan markets or craft fairs where local artisans can sell their handmade goods directly to visitors. Provide opportunities for artisans to interact with visitors, share stories about their craft traditions, and showcase their cultural heritage.
- (r) Organize cultural exchange events and workshops that bring together members of local communities and visitors for meaningful dialogue and collaboration. Encourage cross-cultural learning, mutual respect, and appreciation for diverse perspectives

7.11.2 Local Employment

The operation of the canopy walk requires staff for maintenance, guiding tours, ticketing, and other services, providing employment opportunities for local residents and supporting livelihoods in the area.

Enhancement measures

- (a) Establish community employment initiatives focused specifically on recruiting and training local residents for positions at the canopy walk. Partner with local community organizations, schools, and job training programs to identify and prepare candidates for employment.
- (b) Create targeted youth employment programs to engage young residents in seasonal or part-time positions at the canopy walk. Provide opportunities for students and recent graduates to gain valuable work experience and develop skills relevant to the tourism industry.
- (c) Organize skills development workshops and training sessions to enhance the professional skills and capabilities of local staff employed at the canopy walk. Offer training in areas such as customer service, communication, safety protocols, and natural interpretation.

- (d) Establish clear career pathways and advancement opportunities for local staff within the canopy walk operation. Provide ongoing support, mentorship, and professional development opportunities to help employees progress in their careers and achieve their goals.
- (e) Work with the Sub-county to ensure that revenue from gate collections is used adequately to help community appreciate wildlife.
- (f) Offer flexible employment arrangements, such as part-time or seasonal positions, to accommodate the diverse needs and schedules of local residents. Provide options for job sharing, flexible hours, and remote work where feasible.
- (g) Provide competitive wages, benefits, and incentives to attract and retain local talent. Offer benefits such as healthcare coverage, retirement savings plans, employee discounts, and performance bonuses to enhance job satisfaction and loyalty.

7.11.3 Education and Awareness

The operation of the canopy walk can serve as an educational resource, offering interpretive signage, guided tours, and educational programs to raise awareness about the importance of biodiversity conservation and ecosystem protection.

Enhancement measures

- (a) Install informative and engaging interpretive signage along the canopy walk route highlighting key aspects of biodiversity, ecosystem dynamics, and conservation. Include information about local flora and fauna, ecosystem services, and conservation challenges.
- (b) Develop and offer a variety of educational programs for visitors of all ages, such as guided nature walks, themed workshops, and interactive presentations. Topics can include biodiversity conservation, habitat restoration, wildlife monitoring, and sustainable land management practices.
- (c) Train knowledgeable interpretive guides to lead guided tours along the canopy walk and provide engaging commentary on the surrounding natural environment. Guides can share information about local ecology, species identification, and conservation initiatives.
- (d) Incorporate hands-on activities and interactive exhibits at designated education stations along the canopy walk route. Offer opportunities for visitors to engage with natural materials, observe wildlife behavior, and learn about scientific research methods.
- (e) Engage visitors in citizen science initiatives focused on biodiversity monitoring and data collection. Encourage participation in wildlife surveys, habitat assessments, and phenology tracking to contribute valuable data to scientific research projects.
- (f) Collaborate with local schools, universities, conservation organizations, and community groups to expand the educational reach of the canopy walk. Develop joint programming, research projects, and outreach initiatives to engage diverse audiences and leverage collective expertise.

7.11.4 Cultural Disruption

The influx of tourists and changes in land use patterns can disrupt traditional lifestyles, cultural practices, and social structures of local communities, leading to cultural erosion, loss of identity, and conflicts over resource use and land tenure. **The impact was rated -3 Low.**

Mitigation measures

- (a) Recognize, respect, and preserve the cultural heritage, traditions, and identity of local communities affected by tourism development. Document traditional knowledge, cultural practices, and oral histories to safeguard intangible cultural heritage from erosion and promote intergenerational transmission of cultural values.
- (b) Empower local communities to participate in and benefit from tourism through community-led initiatives that promote cultural authenticity, sustainability, and economic empowerment. Develop culturally immersive tourism experiences, homestays, cultural festivals, or artisanal markets that showcase local traditions, crafts, cuisine, and performing arts.
- (c) Provide cultural sensitivity awareness programs for tourism stakeholders, including tour operators, guides, and visitors, to foster respect, understanding, and appreciation for local cultures and customs. Encourage responsible behavior, cultural exchange, and cross-cultural dialogue to promote positive interactions and minimize cultural misunderstandings or conflicts.
- (d) Involve local communities in participatory tourism planning processes to ensure that tourism development aligns with community priorities, values, and aspirations. Facilitate community consultations, workshops, and visioning exercises to identify opportunities, address concerns, and co-create tourism initiatives that reflect local needs and preferences.
- (e) Promote sustainable natural resource management practices that balance the conservation of natural and cultural heritage with the needs of local communities for livelihoods, food security, and cultural survival. Implement integrated land use planning, zoning regulations, and conservation strategies that protect sacred sites, traditional territories, and culturally significant landscapes from overexploitation or degradation.

7.11.5 Overcrowding and Congestion

Popular tourist attractions like the canopy walk may experience overcrowding during peak seasons, leading to congestion, noise, littering, and degradation of visitor experience, as well as strain on local infrastructure and resources. **The impact was rated -3 Low.**

Mitigation measures

- (a) Develop and implement visitor management strategies to regulate visitor numbers, control access, and distribute visitor flow more evenly throughout the day or week. Implement measures such as

timed entry tickets, reservation systems, or visitor quotas to manage capacity and reduce overcrowding during peak periods.

- (b) Introduce differential pricing or peak season surcharges to incentivize visitors to visit during off-peak periods or shoulder seasons when demand is lower. Offer discounts, promotions, or special offers for visiting during less crowded times to redistribute visitor demand and alleviate pressure on infrastructure and resources during peak seasons.
- (c) Invest in infrastructure upgrades and enhancements to improve visitor facilities, amenities, and services at the canopy walk site to accommodate increased visitor numbers more effectively. Expand parking facilities, restroom facilities, picnic areas, and visitor centers to reduce congestion and enhance visitor comfort and satisfaction.
- (d) Launch educational programs, interpretive displays, or guided tours to raise visitor awareness about responsible tourism practices, environmental conservation, and cultural heritage preservation. Encourage visitors to respect site rules, minimize their environmental impact, and contribute to the preservation of the natural and cultural values of the canopy walk area.
- (e) Provide visitor education and orientation materials, such as brochures, signage, or multimedia presentations, to inform visitors about site rules, safety guidelines, and recommended behavior during their visit to the canopy walk. Emphasize the importance of respecting other visitors, wildlife, and the natural environment to enhance the overall visitor experience.
- (f) Form collaborative partnerships with tourism operators, travel agencies, accommodation providers, and other stakeholders to coordinate visitor arrivals, promote responsible tourism practices, and offer alternative visitor experiences or attractions in nearby areas. Work together to develop sustainable tourism itineraries, packages, or experiences that encourage visitors to explore lesser-known destinations and reduce pressure on overcrowded sites.

7.11.6 Increased human-wildlife conflicts

District local government officials and local community feared that *construction of the project could lead to an increase in cases of human-wildlife conflicts which lead to loss of property and lives. The impact is rated -1 high*, because it was raised repeatedly by the stakeholders.

Mitigation measures

- (a) Provide education on human wildlife conflict prevention
- (b) Encourage and sensitize locals to have diverse livelihood sources to minimize reliance on agriculture.
- (c) Train locals in creating and maintaining community tourism so that they benefit from increase in number of tourists to the area.

7.11.7 Failure for the community to benefit from the increase in the number of tourists to the area

Local community in Sebitoli village feared that as neighbors to the project site, they may not enjoy benefits likely to accrue from increase in tourists. **The impact is rated -1 high**

Mitigation measures

- (a) Encourage and sensitize locals to have diverse livelihood sources.
- (b) Train locals in creating and maintaining community tourism so that they benefit from increase in number of tourists to the area.
- (c) Advertise at different fora community tourism activities in the area.

7.11.8 Insecurity

Although a Kaswa Police Post official reported that no rebel or grave cases had been reported in Sebitoli in 2023, the increase in number of people (Tourists and workers) and rebel threats for Kibale and Rwenzori region as a whole, may cause threats of insecurity in the project area. This will cause a threat to safety of tourists, tour guides and operators. **The impact is rated -3 low**

Mitigation measures

- (a) UWA should develop a security plan in liaison with the LCs and the police to curb cases of theft especially of construction materials;
- (b) Collaborate with the local security in the area to curb insecurity and theft.

7.11.9 Economic Dependency

Communities reliant on tourism revenue from the canopy walk may become economically dependent on the industry, making them vulnerable to fluctuations in tourist numbers, economic downturns, and external shocks such as natural disasters or pandemics. **The impact was rated -3 Low.**

Mitigation measures

- (a) Encourage diversification of local livelihoods beyond tourism by promoting alternative economic activities that are resilient to fluctuations in tourist numbers and external shocks. Support initiatives such as agriculture, small-scale manufacturing, handicrafts, eco-friendly industries, or services that provide additional sources of income for community members.
- (b) Promote the consumption of locally-produced goods and services within the community and among tourists to stimulate local economic development and reduce dependency on external markets. Encourage the use of locally-sourced materials, products, foods, and souvenirs to support local businesses, artisans, and entrepreneurs.

- (c) Explore opportunities for market diversification and niche tourism development to attract a diverse range of visitors and reduce reliance on mass tourism. Identify niche markets such as ecotourism, cultural tourism, adventure tourism, or sustainable travel that align with community values, assets, and resources.
- (d) Develop resilience plans and risk management strategies to anticipate and mitigate the impacts of economic downturns, natural disasters, pandemics, or other external shocks on tourism-dependent communities. Establish contingency funds, emergency response protocols, and social safety nets to support community resilience and recovery efforts.
- (e) Prioritize reinvestment of tourism revenues into community development projects, infrastructure improvements, social services, and environmental conservation initiatives that benefit local residents and enhance community resilience. Allocate funds towards projects that diversify local economies, improve livelihoods, and build long-term sustainability.

7.12 Decommissioning Phase Impacts (Legal / Regulatory Framework)

7.12.1 Restoration Obligations

Legal obligations to restore the site to its original condition or mitigate environmental impacts following decommissioning may require compliance with restoration plans, permit conditions, or regulatory requirements, imposing additional costs and liabilities. ***The impact was rated -3 Low.***

Mitigation measures

- (a) Conduct a thorough assessment of restoration requirements, permit conditions, and regulatory obligations early in the decommissioning planning process. Identify potential environmental impacts and restoration needs to develop a clear understanding of the scope and costs associated with compliance.
- (b) Develop comprehensive restoration plans that outline specific actions, timelines, and performance standards for restoring the site to its original condition or mitigating environmental impacts. Implement restoration measures in accordance with approved plans and permit conditions to ensure compliance with regulatory requirements.
- (c) Establish monitoring and reporting mechanisms to track the progress and effectiveness of restoration activities and demonstrate compliance with regulatory requirements. Implement regular site inspections, environmental monitoring programs, and reporting protocols to document restoration efforts and outcomes.
- (d) Conduct periodic reviews of legal obligations, permit conditions, and regulatory requirements to ensure ongoing compliance with restoration obligations. Stay informed about changes in environmental regulations, permit conditions, and best practices for restoration to adapt strategies and procedures accordingly.

7.12.2 Contractual Agreements

Fulfilling contractual agreements, warranties, or guarantees related to the decommissioning phase, such as performance bonds, insurance coverage, or indemnification clauses, may be necessary to mitigate financial risks and legal liabilities. **The impact was rated -3 Low.**

Mitigation measures

- (a) Require contractors to obtain performance bonds as a form of financial guarantee to ensure that decommissioning activities are completed according to contractual requirements. Performance bonds provide a source of funds for the project owner to cover the costs of completing decommissioning work if the contractor fails to fulfill their obligations.
- (b) Obtain appropriate insurance coverage, such as liability insurance or environmental impairment insurance, to protect against potential financial losses or legal claims arising from decommissioning activities. Ensure that insurance policies provide adequate coverage for risks related to property damage, bodily injury, pollution liability, and other potential liabilities.
- (c) Include indemnification clauses in contracts with project contractors, or third-party vendors to allocate responsibility for any financial losses, damages, or legal liabilities arising from decommissioning activities. Indemnification clauses specify the obligations of each party to indemnify and hold harmless the other party from certain types of claims or losses.
- (d) Establish financial reserves or contingency funds to cover unforeseen costs, expenses, or liabilities associated with decommissioning activities. Set aside funds during the operational phase of the project to ensure that sufficient resources are available to fulfill contractual obligations and address any unexpected challenges during decommissioning.
- (e) Conduct thorough legal review and due diligence of contractual agreements, warranties, and guarantees related to decommissioning to identify potential risks, liabilities, and contractual obligations. Seek advice from legal counsel with expertise in environmental law, contract law, and risk management to ensure that contractual terms are clear, enforceable, and adequately protect the interests of all parties involved.
- (f) Conduct a comprehensive financial risk assessment to evaluate the potential financial impacts of decommissioning activities and identify strategies for mitigating risks. Consider factors such as cost overruns, regulatory compliance, market fluctuations, and third-party liabilities when assessing financial risks associated with decommissioning.
- (g) Implement robust performance monitoring and oversight mechanisms to track the progress and quality of decommissioning activities and ensure compliance with contractual requirements. Establish procedures for regular reporting, site inspections, and performance evaluations to identify any deviations from agreed-upon standards and take corrective action as needed.
- (h) Include dispute resolution mechanisms, such as arbitration or mediation clauses, in contractual agreements to facilitate timely resolution of any disputes or disagreements that may arise during the

decommissioning phase. Establish clear procedures for resolving disputes and addressing claims to minimize delays and mitigate legal costs.

7.12.3 Closure and Access Restrictions

Legal restrictions on public access to the decommissioned site, such as land use designations, conservation easements, or protected area regulations, may impose limitations on future land use or development opportunities for the area. **The impact was rated -3 Low.**

Mitigation measures

- (a) Engage with relevant stakeholders, including government agencies, conservation organizations, and local communities, early in the decommissioning planning process to identify potential legal restrictions and assess their implications for future land use. Collaborate with stakeholders to develop mutually acceptable solutions that balance conservation objectives with potential development opportunities.
- (b) Work with regulatory authorities to explore options for flexible land use planning that accommodates both conservation priorities and compatible development activities within the decommissioned site. Seek opportunities to designate certain areas for conservation or recreation while allowing for limited development in other areas where feasible.
- (c) Adopt an ecosystem-based management approach that considers the ecological values and functions of the decommissioned site in land use decision-making. Develop management plans that prioritize the protection and restoration of key habitats, biodiversity, and ecosystem services while allowing for sustainable development activities that are compatible with conservation objectives.
- (d) Explore opportunities to enhance educational and recreational opportunities within the decommissioned site while respecting legal restrictions on public access. Develop interpretive trails, nature walks, or visitor centers that provide opportunities for public engagement with the area's natural and cultural heritage while minimizing ecological impacts.

7.12.4 Regulatory Enforcement

Regulatory enforcement actions by government agencies or conservation authorities for non-compliance with decommissioning requirements or environmental regulations may result in fines, penalties, or legal sanctions against project developers or operators. **The impact was rated -3 Low.**

Mitigation measures

- (a) Establish a robust compliance monitoring program to regularly assess project activities against applicable regulations, permits, and decommissioning requirements. Conduct internal audits and inspections to identify any areas of non-compliance and address them promptly.

- (b) Maintain open and transparent communication channels with government agencies, conservation authorities, and other regulatory bodies involved in overseeing the decommissioning process. Proactively engage with regulators to clarify requirements, address concerns, and seek guidance on compliance obligations.
- (c) Provide training and capacity building opportunities for project developers, operators, and staff members involved in decommissioning activities to ensure a thorough understanding of regulatory requirements and best practices. Empower personnel to effectively implement compliance measures and respond to regulatory inquiries.
- (d) Maintain accurate and up-to-date documentation of all permits, approvals, and compliance-related activities associated with the decommissioning process. Keep detailed records of monitoring data, inspection reports, and corrective actions taken to demonstrate compliance with regulatory requirements.

7.13 Decommissioning Phase Impacts (Biological Environment)

7.13.1 Vegetation Loss

Decommissioning activities may involve clearing vegetation to access and remove the canopy walk components. This can result in the loss of habitat for native flora and fauna, as well as disruption to ecological processes such as nutrient cycling and plant succession. ***The impact is rated -3 Low.***

Mitigation measures

- (a) Conduct a thorough assessment of the vegetation within the decommissioning area to identify sensitive faunal and floral i.e. rare or endangered plant species, and critical wildlife corridors. Use this information to guide the planning and execution of vegetation clearance activities.
- (b) Minimize the extent of vegetation clearance by carefully planning the location and layout of decommissioning activities. Identify alternative access routes and work areas that require minimal disturbance to native vegetation and wildlife habitats.
- (c) Develop a vegetation restoration plan to mitigate the impacts of clearing activities. Prioritize the replanting of species that were assessed by this study and perhaps cleared during the project implementation period areas to restore habitat quality and support ecosystem recovery. Consider using locally sourced plant material to keep the genetic diversity and resilience.
- (d) Implement timing restrictions for vegetation clearance activities to minimize the potential impact on nesting birds, breeding amphibians, and other wildlife during sensitive periods such as the breeding season. Schedule clearance activities outside of peak wildlife activity periods whenever possible.
- (e) Incorporate habitat enhancement measures into the decommissioning process to offset habitat loss and promote biodiversity. Create wildlife habitat features such as brush piles, log piles, and nesting boxes to provide alternative habitat resources for native fauna displaced by vegetation clearance.

- (f) Implement a monitoring program to assess the effectiveness of mitigation measures and track changes in vegetation composition, wildlife abundance, and habitat quality over time. Use monitoring data to inform adaptive management decisions and adjust mitigation strategies as needed.
- (g) Engage with stakeholders, including local communities, conservation organizations, and regulatory agencies, to solicit input and feedback on vegetation clearance and habitat mitigation plans. Incorporate stakeholder perspectives into decision-making processes to enhance transparency and accountability.

7.14 Decommissioning Phase Impacts (Physical Environment)

7.14.1 Structural Removal

The process of dismantling and removing the canopy walk structure and associated infrastructure can involve heavy machinery and equipment, leading to soil compaction, vegetation damage, and habitat disturbance.

The impact is rated -3 Low.

Mitigation measures

- (a) Develop a detailed dismantling plan that considers the specific characteristics of the site, including sensitive habitats, vegetation, and soil types. Identify areas that require special protection or mitigation measures during the removal process.
- (b) Use manual methods and low-impact techniques whenever possible to minimize the use of heavy machinery and equipment. Consider alternatives such as hand tools, ropes, and pulleys to dismantle and remove the structure without causing excessive soil compaction or vegetation damage.
- (c) Implement measures to protect vegetation and minimize damage during dismantling and removal activities. Use fencing, barriers, or exclusion zones to prevent machinery from entering sensitive areas with valuable or endangered plant species.
- (d) Develop a revegetation and restoration plan to rehabilitate areas affected by soil compaction, vegetation damage, and habitat disturbance. Use native plant species adapted to the local environment to stabilize soils and restore ecosystem function.
- (e) Conduct regular monitoring during the dismantling and removal process to assess the extent of soil compaction, vegetation damage, and habitat disturbance. Implement mitigation measures as needed to address any adverse impacts identified during monitoring.
- (f) Take advantage of the removal process to enhance habitat quality and biodiversity in the area. Consider planting native vegetation, creating wildlife habitat features such as snags or brush piles, and installing erosion control measures to improve overall ecosystem health.
- (g) Engage with stakeholders, including local communities, conservation organizations, and regulatory agencies, to communicate the dismantling and removal plans and solicit feedback. Incorporate input from stakeholders into the planning process to ensure transparency and accountability.

7.14.2 Soil Disturbance

Excavation of foundations and anchor points, as well as the removal of walkway materials, can disturb the soil structure and lead to erosion, particularly in areas where vegetation has been cleared. **The impact is rated -3 Low.**

Mitigation/ measures

- (a) Implement erosion control practices such as installing silt fences, sediment traps, or erosion control blankets to prevent soil erosion and sediment runoff from the disturbed areas. These measures can help retain soil and sediment on-site and protect adjacent ecosystems and water bodies.
- (b) Prioritize the preservation of existing vegetation in areas where excavation and removal activities will take place. Minimize disturbance to vegetation by carefully planning the location of work zones and using temporary exclusion barriers. After completion of the work, implement revegetation efforts using native plant species to stabilize soil and prevent erosion.
- (c) Implement a phased approach to the dismantling process, focusing on one section of the canopy walk at a time to minimize the extent of soil disturbance and erosion. Complete restoration and erosion control measures in each phase before moving on to the next section.
- (d) Develop a stormwater management plan to capture and control runoff from the dismantling site. Use measures such as vegetated swales, infiltration basins, or permeable surfaces to manage stormwater runoff and reduce the risk of erosion and sedimentation in nearby water bodies.
- (e) Establish a monitoring program to assess the effectiveness of erosion control measures and the condition of restored areas over time. Conduct regular inspections and maintenance activities to address any erosion or sedimentation issues that arise during and after the dismantling process.
- (f) Provide training to personnel involved in the dismantling process on erosion control best practices and techniques for minimizing soil disturbance. Assign supervisors to oversee the implementation of erosion control measures and ensure compliance with relevant regulations and guidelines.

7.14.3 Visual Disruption

The presence of demolition materials and disturbed terrain during the decommissioning process can alter the visual aesthetics of the landscape, detracting from its natural beauty and scenic value. **The impact is rated -3 Low.**

Mitigation measures

- (a) Install temporary screening such as fencing, fabric barriers, or vegetative screens to conceal construction materials and disturbed areas from view. Use natural materials or native vegetation where possible to blend with the surrounding landscape.

- (b) Implement a schedule for the timely removal of construction materials and debris once they are no longer needed. Minimize the duration of their presence on-site to reduce visual clutter and restore the natural aesthetics of the landscape.
- (c) Grade and restore disturbed terrain to its natural contours and vegetation cover as soon as decommissioning activities are completed. Use soil stabilization measures such as erosion control blankets, mulch, and native plantings to promote vegetation regrowth and prevent soil erosion.
- (d) Implement a revegetation and landscaping plan to enhance the visual appeal of the decommissioned area and integrate it with the surrounding landscape. Plant native vegetation, trees, and shrubs to restore natural habitat and improve scenic value.
- (e) Conduct a visual impact assessment to identify key viewpoints, scenic vistas, and visual receptors affected by decommissioning activities. Use this information to prioritize mitigation efforts and focus resources on areas with the greatest visual sensitivity.
- (f) Establish vegetation buffer zones or green belts around the decommissioned area to visually screen and soften the transition between disturbed and undisturbed landscape features. Use a mix of native trees, shrubs, and grasses to create a visually pleasing transition zone.
- (g) Integrate design elements such as landscape features, pathways, seating areas, and interpretive signage into the decommissioned area to enhance its aesthetic appeal and recreational value. Consider incorporating natural materials and textures that complement the surrounding environment.
- (h) Engage with the public and stakeholders to solicit input and feedback on visual mitigation measures and landscape design concepts. Use participatory planning processes to involve community members in decision-making and foster a sense of ownership and stewardship.

7.14.4 Noise Pollution

Machinery used during decommissioning activities can generate noise pollution, potentially disturbing wildlife and nearby ecosystems. **The impact is rated -3 Low.**

Mitigation measures

- (a) Consider the use of low-emission machinery powered by cleaner fuels, such as electric or solar powered equipment, where feasible and cost-effective. Replace older, high-emission equipment with newer models that meet stringent emissions standards and environmental performance criteria to minimize air pollution impacts.
- (b) Implement regular maintenance schedules and engine tuning procedures to optimize the performance and efficiency of machinery engines, reducing fuel consumption and emissions of air pollutants. Conduct routine inspections, filter replacements, and emission testing to ensure compliance with emissions regulations and standards.
- (c) Explore alternative fuel options, such as biodiesel, compressed natural gas (CNG), or liquefied petroleum gas (LPG), for powering machinery during decommissioning activities to reduce reliance

on diesel fuel and mitigate air quality impacts. Evaluate the feasibility, availability, and environmental benefits of alternative fuels in the project context.

- (d) Adopt best management practices and operational procedures to minimize machinery idling, optimize engine load factors, and reduce unnecessary fuel consumption during decommissioning activities. Implement efficient work scheduling, route planning, and equipment coordination to maximize productivity while minimizing emissions.
- (e) Implement dust suppression measures, such as watering roads and work areas, using dust control additives, or covering exposed soil surfaces, to minimize fugitive dust emissions from machinery operations during decommissioning activities. Reduce the potential for particulate matter pollution and respiratory health risks for both wildlife and workers.
- (f) Conduct regular air quality monitoring and emissions testing to assess the impact of machinery emissions on local air quality and wildlife habitats. Monitor pollutant concentrations, deposition rates, and ecosystem health indicators to ensure compliance with air quality standards and regulatory requirements.

7.14.5 Air Pollution

Machinery used during decommissioning activities can generate air pollution, potentially disturbing wildlife and nearby ecosystems. Diesel emissions from machinery can also contribute to air quality degradation. **The impact is rated -3 Low.**

Mitigation measures

- (a) Utilize machinery equipped with advanced emission control systems, such as diesel particulate filters and selective catalytic reduction, to minimize harmful emissions. Upgrading machinery to newer models that meet stringent emission standards can significantly reduce air pollution.
- (b) Implement routine maintenance schedules and engine tuning procedures to optimize machinery performance and reduce emissions. Regular inspections, filter replacements, and engine tune-ups can ensure that machinery operates efficiently and emits fewer pollutants.
- (c) Consider transitioning to cleaner alternative fuels, such as biodiesel or renewable diesel, which produce lower emissions compared to traditional diesel fuel. This switch can help mitigate air quality degradation while reducing the environmental impact of machinery operations.
- (d) Encourage operators to adhere to best practices that minimize air pollution, such as reducing idling time, maintaining proper engine load, and avoiding unnecessary engine revving. Efficient equipment operation can help decrease emissions and minimize disturbance to wildlife and ecosystems.
- (e) Implement dust suppression measures, such as using water sprayers or dust control agents, to minimize the generation of airborne dust and particulate matter during decommissioning activities. Controlling dust emissions can help mitigate air pollution and prevent respiratory issues for both wildlife and workers.

- (f) Develop comprehensive site management plans that include strategies for minimizing machinery emissions and protecting nearby wildlife habitats. Establish buffer zones between machinery operations and sensitive ecosystems to reduce the risk of disturbance to wildlife.
- (g) Conduct regular monitoring of air quality and wildlife presence to assess the impact of machinery emissions on the surrounding environment. Monitoring data can inform decision-making and help identify areas where additional mitigation measures may be needed.

7.14.6 Waste generation

Decommissioning activities can generate significant amounts of waste, including construction debris, metal scraps, and discarded materials. Improper handling and disposal of this waste can lead to pollution of the surrounding environment. **The impact is rated -3 Low.**

Mitigation measures

- (a) Develop a comprehensive waste management plan that outlines procedures for the segregation, handling, storage, transportation, and disposal of different types of waste generated during decommissioning activities. Ensure that the plan complies with relevant regulations and environmental standards.
- (b) Prioritize source reduction and waste minimization strategies to reduce the overall amount of waste generated during decommissioning. Implement practices such as salvaging reusable materials, repurposing construction debris, and minimizing packaging to decrease waste generation at the source.
- (c) Establish recycling and material recovery programs to divert recyclable materials, such as metal scraps, wood, and concrete, from landfill disposal. Partner with local recycling facilities or contractors to recycle materials whenever feasible, reducing the environmental impact of waste disposal.
- (d) Implement proper waste segregation practices at the decommissioning site to separate different types of waste streams, such as hazardous materials, non-hazardous materials, and recyclables. Provide designated containers, bins, or storage areas for each waste category and ensure that workers are trained to segregate waste correctly.
- (e) Handle hazardous materials and waste streams, such as chemicals, solvents, and contaminated materials, in accordance with applicable regulations and safety protocols. Use specialized containers, labeling, and handling procedures to prevent spills, leaks, or environmental contamination.
- (f) Dispose of waste materials at licensed facilities that are authorized to handle and treat specific waste streams in compliance with environmental regulations. Ensure that waste disposal contractors are reputable, licensed, and equipped to handle waste safely and responsibly.
- (g) Conduct regular environmental monitoring and inspections to assess the impact of decommissioning activities on soil, water, and air quality. Monitor for pollution indicators such as leachate, runoff, or

emissions to detect any environmental contamination resulting from improper waste management practices.

(h) Ensure adequate sanitary facilities are in place and kept clean daily.

7.14.7 Risk of Soil Contamination

Spills or leaks of fuel, lubricants, or other chemicals from machinery used during decommissioning can result in soil contamination, posing risks to soil health and nearby water sources. **The impact is rated -3 Low.**

Mitigation measures

- (a) Develop and implement spill prevention measures to minimize the likelihood of spills or leaks from machinery and equipment. Provide spill containment systems, such as drip pans, secondary containment barriers, or absorbent materials, to capture and contain spills before they can reach the soil or water sources.
- (b) Conduct regular maintenance checks and inspections of machinery, storage tanks, and fueling stations to identify and address potential sources of leaks or spills. Monitor equipment condition, fluid levels, and integrity of fuel lines and connectors to prevent accidental releases of hazardous substances.
- (c) Train equipment operators and maintenance personnel on safe handling practices for fuels, lubricants, and chemicals used during decommissioning activities. Store hazardous substances in designated areas with secondary containment measures and spill response equipment readily available to contain and mitigate spills if they occur.
- (d) Establish clear procedures and protocols for responding to spills or leaks of hazardous substances, including immediate containment, notification of responsible personnel, and initiation of cleanup and remediation activities. Train staff on spill response techniques, personal protective equipment (PPE) use, and emergency procedures to minimize environmental impacts.
- (e) Conduct environmental risk assessments to identify sensitive areas, such as groundwater recharge zones, surface water bodies, or ecologically valuable habitats, that may be vulnerable to soil contamination from spills or leaks. Implement additional protective measures, such as buffer zones or containment barriers, to safeguard these areas from potential contamination.
- (f) Implement soil monitoring programs to assess the extent and impact of soil contamination resulting from spills or leaks. Conduct soil sampling and analysis to identify contaminants and determine the appropriate remediation measures, such as soil excavation, treatment, or natural attenuation, to restore soil health and protect water sources.
- (g) Implement measures to protect nearby water sources, such as surface water bodies or groundwater aquifers, from contamination resulting from soil pollution. Install groundwater monitoring wells, sediment traps, or erosion control measures to prevent contaminated runoff from reaching water sources and causing further environmental harm.

- (h) Ensure compliance with applicable environmental regulations, permits, and reporting requirements governing the handling, storage, and disposal of hazardous substances. Maintain records of chemical inventories, spill response activities, and soil monitoring results to demonstrate compliance with regulatory obligations and environmental standards.

7.14.8 Residual Impacts

Even after the physical removal of the canopy walk, residual impacts such as soil compaction, vegetation loss, and habitat fragmentation may persist, requiring ongoing monitoring and remediation efforts to restore the affected areas. **The impact is rated -3 Low.**

Mitigation measures

- (a) Conduct a comprehensive assessment of the site following the removal of the canopy walk to identify residual impacts on soil, vegetation, and habitat integrity. Evaluate the extent and severity of impacts to inform remediation efforts effectively.
- (b) Implement soil restoration and rehabilitation measures to address soil compaction and promote soil health and fertility. Techniques such as soil aeration, organic matter addition, and soil amendments can help improve soil structure, water infiltration, and nutrient availability for vegetation regrowth.
- (c) Establish vegetation restoration and reforestation programs to restore native plant communities and ecosystem functions in areas affected by vegetation loss and habitat fragmentation. Plant native tree and shrub species, conduct seeding or planting activities, and implement habitat enhancement measures to accelerate vegetation recovery and promote biodiversity.
- (d) Enhance habitat connectivity and wildlife corridors to mitigate habitat fragmentation and promote species movement and dispersal across the landscape. Create habitat linkages, green corridors, or wildlife passages to reconnect fragmented habitats and facilitate ecological connectivity for wildlife populations.
- (e) Implement invasive species management strategies to control and suppress the spread of non-native plant species that may colonize disturbed areas following canopy walk removal. Conduct invasive species surveys, eradication efforts, and restoration treatments to prevent invasive species from outcompeting native vegetation and disrupting ecosystem recovery.
- (f) Establish long-term monitoring programs to assess the effectiveness of restoration efforts and track ecosystem recovery following canopy walk removal. Monitor key indicators such as soil health, vegetation cover, wildlife presence, and habitat connectivity to evaluate restoration success and inform adaptive management decisions.
- (g) Form collaborative partnerships with government agencies, conservation organizations, academic institutions, and local communities to leverage resources, expertise, and funding for restoration initiatives. Collaborate on research, restoration projects, and capacity-building activities to enhance the effectiveness and scalability of restoration efforts.

8 RISK ASSESSMENT

8.1 Risk assessment enabler

Pursuant to Section 114 and Subsections (1) – (2) of clauses (a) – (c) of the National Environment Act No. 5 of 2019, the proposed Canopy Walk project is deemed eligible for a Risk Assessment. Furthermore, in accordance with Section 47(2) of the same Act, when cumulative impacts in section 9 next chapter, are foreseen to significantly affect human health or the environment, it is obligatory for the proponent to include the proposal for consideration. This obligation is reinforced by the National Environment (Environmental and Social Assessment) Regulations, 2020, along with its Sub-Regulations (1) – (3). It is thus that the risk assessment is necessary to identify and address any potential negative impacts that the Canopy Walk project might generate during construction, operation, and decommissioning. The recognition and handling of these impacts can be accomplished through the implementation of a risk assessment as covered in the section 7 along with Cumulative Impacts in Section 8.

Risk assessment is a process that evaluates the likelihood (probability and exposure) and consequences (magnitude) of positive and negative environmental effects occurring as a result of exposure to one or more hazards. Risk can be described by considering potential events and their consequences, either individually or in combination. It is frequently articulated as the amalgamation of an event's consequences and the likelihood of its occurrence.

In alignment with the risk management framework outlined in the National Environment (Environmental and Social Assessment) Regulations of 2020, essential risk-based assessments have been conducted as a fundamental component of all the ESIS studies. Employing a risk-based methodology to recognize, evaluate, and address the environmental and social risks linked to the project serves to enhance the overall development.

8.2 Risk assessment tools

Various tools are accessible for recognizing and evaluating risks, encompassing qualitative, semi-quantitative, or quantitative (numerical) analyses. Irrespective of the specific risk assessment tool employed, they all adhere to a comparable risk management process. The risk matrix concentrates on qualitatively assessing the potential events' risk linked to the construction, operation, and decommissioning of the project. It serves as a visual representation of risk, considering factors such as likelihood (exposure and probability) and consequence.

The qualitative risk assessment and its intended purpose of identifying potential risks associated with an activity involve the use of technical terms. However, these terms may differ from the specialized opinion of the assessor. Through this approach, the assessment process aims to comprehend the potential consequences of a specific activity. Terms like 'catastrophic' and 'critical' are employed to establish a link between qualitative descriptors of consequences, such as fatalities, and the subsequent outcomes, such as damage to reputation.

The obtained results were utilized for pinpointing intolerable risks, prioritizing efforts for risk reduction, and identifying specific areas for in-depth evaluation. This approach is flexible, accommodating various levels of

information and depths of assessment. It can be applied to identify areas for more extensive evaluation as part of an initial screening effort or to succinctly summarize comprehensive systematic studies. Subsequently, a presentation format, inherently suitable for review, was developed.

8.3 Identification of risks and Categorization of consequence

The identification of risks has employed diverse methods to guarantee the comprehensive and reliable identification of a series of risks, considering both individual and collective aspects, along with their causes, consequences, and unmitigated consequence. After identifying a potential risky activity, an assessment is conducted to ascertain the aspects of that activity that could lead to an impact on various areas, encompassing effects on humans, the environment, the community, social aspects, or legal matters. This process of evaluating activities that may result in an impact is referred to as the risk cause.

The method employed to conduct risk assessments for the Canopy Walk aligns with the stipulations legal requirements outlined in section 7.1. Utilizing this methodology has enabled the UWA assessment to:

- Recognize risks linked to the construction, operation, and decommissioning phases of the project, ensuring that the ESIA technical study teams are aware of these project risks and can integrate them into their respective section.
- Recognize the individual and combined risks to the receiving (Sebitoli) environment connected with the Canopy Walk project.
- Offer a uniform approach and system for rating risks throughout diverse technical study domains, facilitating a comparative evaluation of risks across all study areas.
- Determine the residual risk ratings for the particular activities evaluated, considering the mitigation measures already incorporated into the design or standard operation.
- Recognize risks necessitating supplementary mitigation measures to diminish their residual risk rating to levels deemed acceptable and as low as reasonably achievable.

The list below outlines the process for populating the risk registration within the context of the broader methods for identifying and assessing risks.

- Identify risks - risk title, risk causes, consequences, assumptions, existing controls
- Analyse risks – inherent consequence, consequence, exposure, probability, likelihood, residual risk
- Evaluate risks
- Treat risks.

The risk assessments conducted for the Canopy Walk project address key project elements, including social, biodiversity (wildlife, trees, and tree falls in a 450m long canopy walk facility) and security. UWA, with its technical teams, para-military force, and collaborative efforts with Uganda Police Peoples Defense Forces, possesses significant experience and expertise in conducting risk assessments for projects of similar nature. The GMP of KNP identifies risks as part of management actions. However, each protected area under UWA management presents unique risks encompassing social, landscape, biodiversity, and environmental aspects. Therefore, the methods employed in this assessment only reflect the approach taken for the Canopy Walk project, specifically using the ESIA risk-based approach. The potential environmental and social

impacts have been evaluated using this methodology. The specific reasons for this approach are outlined below:

- As for biodiversity, the risk assessment followed the likelihood approach, with the consequence descriptors observed and recorded around the project area accurately correlated to reflect the potential consequences.
- While the risk assessment employed the site observations approach, the consequence and likelihood descriptors were developed into a risk matrix by diverse experts. The purpose of this risk matrix was to compare it against other factors within the Canopy Walk facilities.
- A quantitative risk assessment for injury and fatality risks was conducted in accordance with the proposed establishment. Both qualitative and quantitative risk assessments were taken into account for safety management concerning the proposed height of the canopy walk.
- In the Social Impact Assessment approach, the consequence and likelihood descriptors, along with the risk matrix, were compared based on various enabling environments to align with the guidelines of the relevant government MDAs.

8.3.1 Assessed Likelihood

After identifying potential risks, their likelihood of occurrence can be assessed by predominantly qualitative means. This assessment involves evaluating the level of exposure to the risk and the probability of the risk causing the calculated consequence, considering the implemented mitigation measures. The accompanying Table 8-1 illustrates the categorization of the likelihood of occurrence, employing estimated quantitative probabilities that denote the expected number of occurrences within a specified timeframe.

Likelihood matrix

Table 8-1: Likelihood matrix

	259

Risk Exposure								
Probability			Not in 100 years	At least once in 100 years	At least once in 10 years	At least once a year	At least four times a year	At least once per week
			E1	E2	E3	E4	E5	E6
	Not known to occur in a comparable activity internationally but plausible 1 in 100,000 to 1,000,000	P1	0	0	0	0	1	1
	Known to occur in a comparable activity internationally but unlikely 1 in 10,000 to 100,000	P2	0	0	0		1	2
	Has occurred or could occur for this or a comparable activity in Australia 1 in 1,000 to 10,000	P3	0	0	1	1	2	3
	Expected to occur infrequently during this activity 1 in 100 to 1,000	P4	0	1	1	2	3	4
	Expected to occur occasionally during this activity 1 in 10 to 100	P5	1	1	2	3	4	5
	Expected to occur frequently during this activity 1 in 10	P6	1	2	3	4	5	6

A likelihood rating of zero (0) denotes that the likelihood may not be considered credible and the subsequent risk rating is given as 'not credible'. The likelihood is assessed after existing mitigation measures have been identified and is calculated on an exposure to, and probability of, the event occurring.

8.3.2 Risk level assignment

The amalgamation of the probability of an event and its corresponding consequence allows the determination of the comprehensive risk level, commonly referred to as the 'residual risk.' The assigned risk level considers the planned safeguards, recognized as 'mitigation measures.' Consequently, the relevant risk level pertains to the 'residual' risk anticipated after the implementation of mitigation measures. Utilizing the calculated scores from the Likelihood Table 8-2 and assessing the consequence category from the preceding table, the unmitigated risk ranking for a specific project activity and/or aspect can be ascertained with the assistance of the subsequent table

Table 8-2: Risk matrix

		Likelihood					
		1 Remote	2 Highly unlikely	3 Unlikely	4 Possible	5 Likely	6 Almost certain
Consequences	6 Catastrophic	Medium	Medium	High	High	Very High	Very High
	5 Critical	Low	Low	Low	High	High	Very High
	4 Major	Low	Low	Low	Medium	High	High
	3 Serious	Negligible	Low	Low	Low	Medium	High
	2 Moderate	Negligible	Negligible	Low	Low	Low	Medium
	1 Minor	Negligible	Negligible	Negligible	Low	Low	Low

Risk contours

Risk contouring offers a visual depiction of the proximity of a specific injury or fatality risk concerning the project. If a risk contour extends beyond the project boundary, it is essential to calculate the subsequent change in contours for other ongoing and planned project activities. This cumulative risk assessment is crucial, ideally grounded in existing regulations that encompass Tourism and Wildlife Hazardous Sector Planning, although some of these regulations may not be fully established yet.

8.3.3 Treat risks

The assessment team carefully evaluated various potential mitigation measures that maybe applied and document them in the risk registers, along with the resulting treated risk rating. Subsequently, these mitigation measures may undergo review, and the residual risk level is assessed. Risk assessment teams then decide whether treated (residual) risks can be further mitigated, are within acceptable tolerances, or necessitate additional treatment. In cases where further risk reduction is deemed necessary, action plans are formulated. The document also provides a description of proposed mitigation measures for specific aspects of the assessment.

8.3.4 Monitor and review

Ongoing monitoring and review is essential to ensure the risk assessments that have been conducted remain relevant. Factors and assumptions that were used are subject to change, such as new risks identified, new mitigation measures implemented, existing mitigation measures removed, new consequence identified and so on. These have the potential to alter the risk rankings, either positively or negatively.

The risk registers require to be put in place and should be reviewed and revised as necessary during the implementation when additional information becomes available through specialist technical reports. The risk assessment process should continue to be reviewed and revised throughout all phases of the Project. As a minimum, these reviews will be done in accordance with the following frequency/events:

- Annual basis
- Emergency incident
- Identification of non-compliance with environmental authority conditions
- Legislative changes (including standards and guidelines)
- New or changed in processes (including addition or removal of mitigation measures)
- When further risk studies are undertaken (e.g. Hazard Identification Study (HAZID), Hazard and Operability Study (HAZOP), job hazard analysis).

UWA should ensure that its risk assessment methodology remains current and reflects operational accepted norms as part of the annual review process. Monitoring of the effectiveness of mitigation measures should also be undertaken throughout all phases of the project. This monitoring should be undertaken through a combination of continuous monitoring (e.g. measuring parameters), and internal and external audits.

8.3.5 Cumulative impacts

The approved TORs from NEMA for the ESIA also propose the identification of critical environmental concerns not initially foreseen during the preparation of the Scoping Report and assessment TORs. This necessitates an examination of risk assessment and cumulative impacts from other known, existing, or proposed projects, with detailed information provided to the ESIA team. The team employed the following approaches to identify cumulative impacts:

- Identification of current and proposed projects with the potential to impact the Project.
- Review of publicly available information, public engagement, and consultations related to these projects.
- Identification and assessment of cumulative impacts. Notably, this assessment has been conducted qualitatively due to limited available data for a comprehensive quantitative analysis.

While determining cumulative impact, the ESIA team considered the effects arising from small-scale investments within the Project area, such as a stopover restaurant, mini-museum, and information center. Additionally, consideration was given to the cumulative effects of small-scale developments within the Sebitoli zone. Therefore, the assessment of risks related to the Canopy Walk project followed a systematic approach

to identification and evaluation. The process aligns with the impacts highlighted in specialist studies and involves the following steps:

- Establishing the context
- Identifying risks and hazards
- Analyzing risks
- Evaluating risks
- Treating risks
- Monitoring and reviewing risks

To ensure consistency in the assessment of qualitative risks and facilitate comparisons across the project area, a common risk matrix and scoring system were employed, where applicable. Any alternate descriptors used in risk assessments for specific study was duly noted in the impact assessment section. Quantitative risk assessments were conducted where sufficient data was available to determine risks associated with identified impacts.

The hazard identification and risk analysis process within the ESIA team engaged subject matter experts from technical disciplines. Some disciplines, as per their norm, utilized risk evaluation methodologies.

The outcomes of both qualitative and quantitative risk assessments were thoroughly discussed. In cases where mitigation measures were necessary to reduce risks to an acceptable level, these measures were identified. Furthermore, the risk assessment process considered not only individual and collective risks associated with the project but also considered the cumulative impacts that other projects (both existing and proposed) might have within the study areas.

All risk assessments were conducted holistically, adhering to the TORs for the ESIA guidance from NEMA. The assessments addressed risks to both biophysical environments within the project area of the Canopy Walk.

9 CUMULATIVE IMPACT ASSESSMENT

9.1 The rationale and methods for cumulative assessment

The aim of the cumulative impact assessment is to consider the potential effects of the Canopy Walk, along with other ongoing or planned projects in the region, which could collectively influence a variety of environmental, social, and economic aspects, has been considered. However, this proposal being a biodiversity friendly project its impacts include of direct, indirect, and cumulative were understood as those impacts on natural habitats from a small project.

Ongoing projects are those that have initiated development but involve one or more components not aligned with current or baseline environmental values. For instance, the cumulative impact of land clearing (which will not happen or it may) during the construction phase of the project may be considered part of the existing environment, while air emissions from the operational phase won't be considered part of the Canopy Walk until after the project has been commissioned.

The ESIA team has sought to evaluate these cumulative impacts. The application outlines the methodology employed to determine the projects included in the cumulative assessment and the subsequent evaluation of their impacts.

In the surrounding area of the three project components, there are presently several ongoing projects that may add to cumulative impacts. The selection of additional projects suitable for inclusion in the cumulative impact assessment was determined by:

- The project falls within the designated area of potential influence.
- If the Environmental and Social Impact Assessment (ESIA) for the proposed projects has been either completed or is currently underway, or if the project's initial advisory statement has been issued.

Projects meeting these criteria and deemed feasible for impact assessment were considered for inclusion in the cumulative impact assessment. A total of six projects, including the Canopy Walk project, underwent analysis.

The connection between the projects and the Canopy Walk Project, and the potential areas where cumulative impacts might occur, like the skilled labor resource thought all phases. The positions of the projects within the Canopy Walk environment and the surrounding area.

It is important to acknowledge that the status and potentially other details of these projects are subject to plans that may undergo changes in the future. The cumulative impact assessment outlined in this ESIS reflects the information currently available on these projects.

The importance of assessing cumulative impacts on the physical/biological, social, cultural, economic, and environmental aspects of canopy walk was examined. This evaluation was based on the methodologies outlined in the respective sections of the ESIS that align with the pertinent environmental or other values.

Table 9-1: Lists of assumed projects planned in and around the area

Project and Proponent & sub/contractor(s)	Project description	Location	Project status	Relationship to the CW-in-KNP Project
UWA	Establishment and operation of stopover point with a restaurant, mini-museum /information center, craft shop	Sebitoli Sector view proposed by to be developed at a later stage, actual plan not developed yet	A view proposed by UWA	To be depended on by tourists visiting the area
UWA	Establishment of a zip line	Sebitoli Sector project to be proposed in future	A view proposed by UWA	A component that will enhance tourism in the area
UWA	Improvement of the UWA Sebitoli campsite to accommodate more tourists	The project will be proposed in future		This component will enhance tourist visits in the community

The cumulative assessment is discussed under the following environmental categories, which generally follow those described in the ESIS:

- Air quality
- Canopy visual amenity
- Forestry ecology
- Noise
- Traffic and transport
- Waste
- Hazard and risk
- Social
- Economic

In certain instances, the evaluation of the aforementioned environmental categories focused solely on projects situated near or proposed within the CW-in-KNP project study areas. This limitation arises from the fact that the cumulative impact of specific environmental influences does not extend into the Sebitoli zone of KNP. For instance, noise and potential vibration emissions during construction do not combine with those generated by vehicular traffic on the Fort Portal – Kampala road. Nevertheless, some environmental categories require consideration in connection with each project element, as their impacts extend beyond the immediate project study area. An example is greenhouse gas emissions. Given the extensive scale of existing or proposed developments in the region, it becomes necessary to assess the cumulative social and economic impacts on a seasonal basis within the framework of each of the three individual cumulative assessments for the Canopy Walk project. The discussion in (chapter 7) addresses the nature and importance of potential

cumulative impacts on the physical/biological, social, cultural, economic, and built environmental values associated with each of the main elements of the Project.

These sections outline the possible cumulative effects during both the construction and operational phases linked to each element of the Project. The impacts on these values can emerge from factors such as the positioning of project areas, the timing of development plans, and the allocation of services and resources. Although all the previously identified assessed projects, whether existing or proposed, encompass a variety of project types, they can be broadly classified into three groups as follows:

- Biodiversity
- Canopy walks construction operation and decommissioning
- Former saw-mill area
- Social

The matrix illustrates the values influenced by various project categories based on the potential for them to be built or operated in close proximity. If the projects are situated in the Sebitoli zone of KNP, the cumulative impacts could either worsen adverse effects or amplify positive impacts.

In conducting this assessment, it is assumed that the current projects and those expected to be proposed and developed do not overlap. This assumption is made based on the absence of projects outlined in the district plans, as well as the lack of proposals for tea estates or strategic developments like regional infrastructure, excluding tourism diversification. This approach ensures a conservative evaluation of potential adverse cumulative impacts.

10 DECOMMISSIONING

10.1 Timeline

There is no specific timeframe established for decommissioning the CW-in-KNP; however, this ESIA has addressed the procedures for decommissioning and proposed corresponding measures. The document outlines the impacts linked to decommissioning, evaluates them, and puts forth suggested mitigation measures. Consequently, management and monitoring plans encompass facets related to the mitigation measures associated with decommissioning.

The primary challenge will revolve around managing the steel and solid waste generated during the dismantling of the structure and the excavation of concrete, especially considering the project's location in an area originally used for a sawmill. While there is potential for reusing some of the concrete, aligning with Uganda's Circular Economy initiatives, proper handling methods, including waste disposal, must adhere to the Waste Handling Regulations. Disposing of solid waste should follow appropriate procedures and acceptable practices. The approach used to construct the canopy walk without harming any trees should be replicated during its dismantling.

While KNP has its waste handling practices, being 17km from Fort Portal City suggests a collaborative effort in managing municipal waste, as recommended earlier.

10.2 Procedure

1. Impact Assessment:

It is in best practice that UWA complies with the National Environment (Environmental and Social Assessment) Regulations, 2020. Nonetheless should the time for the decommissioning be decided;

- Conduct a thorough impact assessment to identify potential environmental, social, and safety impacts associated with decommissioning.
- Evaluate the structural integrity of the Canopy Walk and assess any risks associated with dismantling.
- As a norm according to the establishment the proposed Canopy Walk should be subjected to comply with the National Environment (Audit) Regulations, 2020. It is from the Audit findings that other adjustments will be decided upon during the operations.

2. Stakeholder Engagement:

- Communicate with all stakeholders to keep them informed about the decommissioning process.
- Seek input from stakeholders and incorporate any concerns or suggestions into the plan.

3. Waste Management:

- Develop a comprehensive waste management plan to handle steel, concrete, and other materials generated during dismantling.
- Prioritize reuse of materials where feasible and adhere to Uganda's Circular Economy initiatives.
- Follow Waste Handling Regulations for proper disposal of waste to minimize environmental impact.

4. Tree Preservation:

- Employ the same careful approach used during construction to preserve trees in the vicinity.
- Collaborate with environmental experts to ensure the protection of flora and fauna during the decommissioning process.

5. Safety Measures:

- Implement safety protocols to protect workers and visitors during decommissioning.
- Provide necessary training for personnel involved in the dismantling process.

6. Documentation:

- Keep detailed records of the decommissioning process, including impact assessments, waste management records, and safety measures undertaken.
- Document any unexpected challenges encountered during the decommissioning phase.
- It may be also important that every month an ESMP monitoring is prepared and eventually accrues to a benchmarking step.

7. Monitoring and Reporting:

- Establish a monitoring plan to assess the environmental and social impacts post-decommissioning.
- Regularly report progress to park management, local authorities, and other stakeholders.

8. Collaboration with Local Authorities:

- Collaborate with Fort Portal's waste management practices and coordinate efforts to manage municipal waste effectively.

9. Restoration and Rehabilitation:

- Develop a plan for the restoration of the decommissioned area, considering the park's natural ecosystem should there be a temporal impact on the surrounding nature.
- Implement rehabilitation measures to ensure the site returns to its original state as much as possible.

10. Closure and Handover:

- Officially close the decommissioning process with proper documentation.

- Hand over all relevant records and findings to KNP management for future reference.

11 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

11.1 Impact Management

Plans for the implementation of enhancement and mitigation measures for the proposed project are provided in Table 11-1 below. The Plan indicates institutional responsibilities, time to take the action and estimated costs. The proposed costs are only indicative, should the proposed development proceed with the suggested changes, then UWA will have to work out actual costs and include them in the overall cost of the project. Based on the NEA, No.5 of 2019, NEMA will be responsible to ensure compliance of all the agreed conditions for authorization.

Table 11-1: Plan for Implementation of Environmental and Social Enhancement Measures for the proposed Canopy walk

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
	Enhancement measures of positive impacts associated with construction				
Support to national policies	POSITIVE	Government to ensure effective implementation of the policies and laws that promote sustainable tourism in Uganda	UWA UTM MTWA MFPED	During Construction. and beyond	
Change in life style	POSITIVE	- Awareness on savings schemes -Provide on job training to workers -Support formation of SMEs for the workers	UWA	During construction	
Change in the level of employment	POSITIVE	-Recruitment to consider local communities. -Employment should be on equal opportunities for both gender -Provide on job training	UWA	During construction	
Economic benefit to local communities	POSITIVE	-Kabarole District Council to implement strategies of linking Canopy Walk development with local economy (e.g. agriculture, livestock, handcraft, construction materials); - Ensure accountability to public on revenue generated from levies and taxes for the lodge at local level; -Local communities to acquire relevant skills for hospitality development	Kabarole District UWA	During construction	
	Enhancement measures associated with operation phase				

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
Support to KNP's GMP and policies	POSITIVE	-Promote tourism, locally and internationally; -Ensure conservation of KNP and abide with the GMP -Put in place an effective centralized booking system of tourists to control tourism	KNP	During Operation	
Support to National policies	POSITIVE	-Government to introduce labour laws that would compel UWA to employ local staff with relevant qualifications; -Promote tourism, locally and internationally; -Develop mechanisms that will compel Canopy Walk developers/contractors procure more goods and services from local service providers; -Develop mechanism for improving local products; -Provide capacity building programmes for hospitality and tourism	MTWA UTB Development partners	Operation and beyond	
Change in life style and quality of life	POSITIVE	-Provide awareness to workers to initiate income generating activities and SMEs; -Encourage establishment of SACCOS at work place; -Provide on job training.			

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
		Sensitisation on national cultures and values to the workers			
Increase in levels of employment	POSITIVE	-Recruitment to consider local communities -Employment should be on equal opportunities for both gender -On job training. -Encourage establishment of SACCOS at work place -Government to promote establishment of training institutions on hospitality and tourism management	UWA Kabarole District Local Government MTWA UTB	During operation and beyond	
Level of benefit to National economy	POSITIVE	-Ensure efficient collection of different taxes. -Introduce effective booking system of tourists for tax collection and monitoring. -Promotion of tourism industry -Enhance conservation of tourist destinations in the country -Diversify tourist products (e.g archaeological tourism, cultural tourism, gender tourism, nature tourism)	UWA UTB MTWA MFPED	During operation and beyond	
Economic benefits to local communities	POSITIVE	-Communities to be encouraged to produce quality goods (handicrafts, agricultural and livestock products) & services (hotel services e.g. housekeeping) for the hotels; -Local communities to acquire skills and knowledge relevant for the hospitality and tourism industry;	UWA UTB MTWA Kabarole District Local Government; Community Development Office	During Operation	
		273			

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
		-Ensure good governance & accountability of revenue generated from tourism for local communities	-NGOs -CBOs		
Change in species and habitat diversity	NEGATIVE	-Habitat restoration -Species monitoring and invasive species control -Implement adaptive management -Collaboration with Conservation Organizations	UWA/Operator	Throughout the project cycle	Low
Wildlife harassments	NEGATIVE	-Observe speed limits as per protected area management rules -Adhere to time of construction -Abide to KNP regulation	UWA/Operator	During construction	Low
Change in scenic quality	NEGATIVE	-Proper waste management -Confine to the core area -Adhere to time of construction -Blend canopy walk structures with forest environment -Adhere to KNP - GMP and regulations	UWA/Operator	During construction	Low
Incompatibility with KNP's - GMP and policies	NEGATIVE	-Adhere to KNP- GMP and policies - Look for alternative site for the lodge	UWA/Operator	Prior to construction	High because the GMP will be outdated in a year's time
Noise pollution	NEGATIVE	-Adhere to time of construction -Use noise dampening equipment -Some building materials and components to be processed off-site and fixed on site	UWA/Operator and contractor	During construction	Medium
Dust pollution	NEGATIVE	-Adhere to time of construction -Use water howitzers to dampen dust in case a new access route will be opened	UWA/Operator and contractor	During construction	Low

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
		-Confine to core area	Districts Community Development Office NGOs/CBOs		
Change in population size, values and norms	NEGATIVE	- Provide awareness to public on local norms and values - KNP management to strengthen security and anti-poaching -KNP to participate in screening workers to weed out known poachers in case there are; -KNP management to raise awareness to workers in values of conservation - Adhere to construction time -KNP to enforce entry regulations -Consider adding conducting community out reaches to the adjacent community	District Community Development Office NGOs/CBOs	During construction	Low
Increased incidences of diseases and ill health	NEGATIVE	-Medical Support and Sanitation Facilities -Health education per new fleet of visitors -Vector Control: Implement measures to control vectors of disease transmission -Monitoring and Surveillance to track incidences of diseases among visitors and staff -Staff training: on visitor screening	UWA/Operator	Throughout the project cycle	High
Incidences of risks, hazards and accidents	NEGATIVE	-Adhere to construction time and schedule - Limit number vehicles to the site to those for construction only	UWA Contractor	Throughout the project cycle	Low

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
		-Avoid construction during high season -Process some of the materials outside for fixing on site - Establish speed limit. Enforcement will be key.	Tourist vehicles		
Pressure on utilities	NEGATIVE	-Project workers should ensure they pay fairly and timely for services consumed. -Water harvesting may be practised by workers and community encouraged to do so.	Contractor	During construction	Low
Effects of social cohesion	NEGATIVE	-Recruiting project workers from within the project area as a strategy to reduce the influx of people. -Sensitize project workers against unnecessary interactions and ensuring following cultural norms of the area. -Support the existing health centres in the project area to enhance the provision of services to unexpected increased population. -Popularize the community grievance mechanism.	Contractor UWA	During construction	Low
Mitigation of the impacts associated with operation phase					

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
Waste management	NEGATIVE	-Developer to treat all generated waste biologically -Put in place specific personnel to collect, sort, and manage at a generation point within the canopy walk and dispose of following NEMA standards of waste treatment and practices respectively properly all solid waste -Adhere to KNP waste management regulations and practices.	UWA/Operator	During operation	<i>Medium</i>
Change in habitat and species diversity	NEGATIVE	-Treat all waste biologically and as relevant to the site to avoid any species to feed on them -Collect, sort, treat/dispose of waste generated properly -Abide to UWA waste management regulations -Conduct detailed assessment of the impact of waste on the species and habitat diversity along the Canopy Walk	UWA/Operator	During operation	<i>Low</i>
Wildlife harassment	NEGATIVE	-KNP management to consider planned canopy walks based on understood specific wildlife species behavior -KNP to enforce its LAU on roads -KNP to revise fees upwards for penalties for offences regarding off road driving -KNP to limit number of vehicles to the crater -KNP should consider alternative products apart from game viewing	UWA/Operator	During operation	<i>Low</i>

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
Change in scenic value	NEGATIVE	-Collect, sort, treat/dispose of solid/liquid waste properly -Abide to KNP waste management regulations & design a specific solid and human waste management plan in the Canopy Walk	UWA/Operator	During operation	<i>Low</i>
Increased incidences of diseases and ill health	NEGATIVE	-Provide awareness to public on referral pathways HIV/AIDS and other diseases such as ebola, cholera, etc., - Provide VCT centres		During operation	<i>Medium</i>
Change in the level of population	NEGATIVE	-KNP to enforce entry regulations -Conduct campaigns on environmental education -KNP to limit number of vehicles to the Sebitoli zone -Kabarole District Local Government to enforce by-laws on conservation -Develop & encourage workers to form SACCOS -Housing of workers on the Canopy Walk to be managed under UWA accommodation guidelines	UWA	During operation	<i>Low</i>
Increased traffic levels	NEGATIVE	-KNP management to revise upwards penalties for protected area offences -KNP management forecasts tourist numbers on the Canopy Walk -KNP management to commission detailed study on factors causing overcrowding in case of business picking up	KNP management	During operation	<i>Medium</i>

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
Increased human-wildlife conflicts	NEGATIVE	-Compensate locals who were affected by animal raids in previous years. -Encourage and sensitize locals to have diverse livelihood sources to minimize reliance on agriculture. -Train locals in creating and maintaining community tourism so that they benefit from increase in number of tourists to the area.	UWA Kabarole District Local Government	High	
Failure for local community to benefit	NEGATIVE	-Encourage and sensitize locals to have diverse livelihood sources. -Train locals in creating and maintaining community tourism so that they benefit from increase in number of tourists to the area. -Support existing community tourism activities. -Advertise at different fora community tourism activities in the area.	UWA Kabarole District Local Government	High	
Insecurity	NEGATIVE	-Encourage community policing in order to identify the culprits and to ensure safety of tourists and project materials; -UWA should develop a security plan in liaison with the LCs and the police to curb cases of theft especially of construction materials; -Collaborate with the local security in the area to curb insecurity and theft.	UWA Uganda Police/UPDF Kabarole District Local Government	Low	
Incidences of risks and hazards	NEGATIVE	-Proper disposal of solid waste -Stakeholder-engagement -Regulatory compliance -Regular inspections and maintenance	-UWA/ Operator -UTB	Once in three months	Low



Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
		-Data sharing on the safety of the Canopy Walk with management -Emergency preparedness and Response towards wildlife behavior, -Risk Assessment & Management Plan -Visitor monitoring and Capacity management: -Visitor education and interpretation -Staff training and certification	-Waste handler -MTWA -MGLSD		
Compliance with the National Environment (Audit) Regulations, 2020	NEGATIVE	Undertake Environmental & Social Audit as per its Regulation 3 sub regulation 1 - 2	UWA/Operator	Annually throughout the project life cycle	90,000,000/= (UGX)
Mitigation of the impacts associated with Decommissioning					
Change in scenic quality	NEGATIVE	-Proper waste management -Confine to the core area -Adhere to time of construction -Blend canopy walk structures with forest environment -Adhere to KNP - GMP and regulations	UWA/Operator	During decommissioning	Low
Loss of employment	NEGATIVE	- Proper and timely payments of pension/terminal benefits of workers after services	UWA/Operator	During decommissioning	Low
Dust pollution	NEGATIVE	Contractors during construction will use existing roads and there will be no any additional access route that will be added	UWA/Operator Contractor	Throughout project cycle	Low

Identified Impact	Impact Sense (Positive / Negative)	Enhancement /mitigation Measures	Responsible Institution	Time of mitigation	Rating & Relative cost (UgX) to change as per inflation of the time
Change in life style and quality of life	NEGATIVE	-Proper and timely payments of pension/terminal benefits of workers after services	UWA	During the Operation	
Reduced benefits to communities and local economy	NEGATIVE	-Provide on job training for various trade and skills -Awareness on investment opportunities (e.g. SME activities)	-UWA -UTB -MTWA -NGOs -CBOs	Before decommissioning	<i>Low Cost:</i>

12 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

12.1 Baseline monitoring

Ensuring ESIA follow-up and rigorous monitoring is paramount in implementing NEA, No. 5 of 2019 and associated legal frameworks in Uganda. Without consistent monitoring, mitigation strategies and improvement measures become ineffective. Both the 2020 National Environment (Environmental and Social Assessment) Regulations and National Environment (Audit) Regulations, along with other relevant laws, outline necessary steps to address this issue. Consequently, there exists a direct correlation between the effectiveness of mitigation efforts and the thoroughness of monitoring. This monitoring should encompass assessing compliance and evaluating the impact of mitigation and enhancement measures. As such, NEMA assumes a central role in coordinating, licensing, permitting and regulating these activities, collaborating closely with pertinent sectors and stakeholders.

Monitoring refers to the systematic collection of data through a series of repetitive measurements over a long period of time to provide information on the characteristics and functioning of environmental and social variables in specific areas over time. There are four types of monitoring that are also relevant to this ESIA. These are (Sadler, 1996).

During both the pre-project and operational phases, environmental parameters are measured to identify natural variations and, if feasible, discern patterns of change.

12.2 Impact/effect monitoring

Involves measuring parameters (performance indicators) during the construction, operation, and decommissioning phases to detect and quantify environmental and social changes that may have occurred due to the project. This monitoring offers insights for future projects and lessons that can enhance methods and techniques.

12.3 Compliance monitoring

Involves periodic sampling and ongoing measurement to evaluate adherence to standards and thresholds, including those related to waste discharge and air pollution.

12.4 Mitigation monitoring

Aims to determine the suitability and effectiveness of mitigation programs designed to reduce or compensate for the adverse effects of the project.

Chapters 6 and 8 offer extensive information on the impacts, enhancement, and mitigation measures. This chapter introduces a proposed monitoring plan. Based on the preceding discussions, numerous components for monitoring will form an integral part of the development project. Thus, monitoring will encompass various aspects, including the potential for enhanced income and lifestyle changes, increased job opportunities and

revenue. Additionally, it will address concerns such as waste management, water usage, dust and noise pollution, heightened traffic within the Sebitoli zone KNP, as well as environmental degradation and wildlife disturbance resulting from increased vehicle activity.

Monitoring is essential to assess the effectiveness of enhancement measures and mitigation options, as well as to gather information for future developments and planning processes. In the following Table 12-1 below outlines the attributes to be monitored, their frequency, institutional responsibilities, and estimated costs. These costs are approximate and will be borne by various stakeholders. UWA-covered costs should be incorporated into the project budget, while those covered by other stakeholders, such as NEMA, Kabarole District Local Government, should be treated separately, despite being part of the overall project expenses.

Table 12-1 below provides the Social and Environmental Monitoring Plan for Implementation of Enhancement options and mitigation measures for the proposed canopy walk

Table 12-1: Environmental and Social Monitoring Plan

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
Impacts associated with both the Construction and Operation phases						
Support to national policies	Positive Impact	The MTWA and all relevant government stakeholders to ensure effective implementation of the policies and laws that promote sustainable tourism in Uganda	MTWA UTB UWA etc	Once during construction and operation	No. of High-quality tourism facilities and services improved and established in Sebitoli and Kabarole District and surrounding areas	Low:
Change in life style	Positive Impact	-Awareness on savings schemes -Provide on job training to workers -Support formation of SMEs for the workers	UWA/Operator Contractor Kabarole District Local Government	Twice during construction	-Number of awareness seminars offered -Number of functioning SME -Number of workers obtaining basic properties after employment	Low:
Change in the level of employment	Negative Impact	-Recruitment to consider local communities. -Employment should be on equal opportunities for both gender -Provide on job training.	UWA/Operator Contractor Kabarole District Local Government	Twice a year throughout the project cycle	Roaster of employees to verify origin and gender -Number type of skills acquired in gender disaggregation	Low
Economic benefit to local communities	Positive Impact	-Implement strategies linking Canopy Walk development with local economy (e.g. farming, handcraft, cultural tourism, construction materials)	UWA/Operator Contractor Kabarole District Local Government	Twice during construction	-Strategies developed & implemented -Number of local communities selling goods to the tourists	Low

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
		- Ensure accountability to public on revenue generated from levies and taxes for the Canopy Walk at local level -Local communities to acquire skills for hospitality development			-Levels of income generated from business with canopy walk to Kabarole District -Audited reports available to public	
Change in species and habitat diversity	Negative Impact	-Implement comprehensive monitoring programs to track changes in species composition and habitat quality before, during, and after construction, enabling timely intervention if adverse effects are detected -Optimize the design of the canopy walk to minimize its footprint on surrounding habitats, avoiding critical habitats or sensitive species' territories whenever possible	UWA/Operator Contractor Kabarole District Local Government Environment office	Once during construction	-Species richness and abundance -Indicator species that are particularly sensitive to habitat changes & can indicate overall ecosystem health :	Low
Wildlife harassments	Negative Impact	-Schedule construction activities during seasons	UWA/Operator Contractor	Daily during guided canopy walk tours throughout project cycle	-Data recorded by tour guides - Incidences occurrences involving animals -Reported traffic offences	Low

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
Incompatibility with KNP's - GMP and policies	Negative Impact	-Adhere to KNP -GMP and UWA Policies	UWA	Pre-construction Operation & decommissioning	Updated KNP - GMP	
Noise pollution	Negative Impact	- Adhere to time of construction - Regular notification to tourists and drivers -Confine to core area	UWA/Operator Contractor	Daily during guided canopy walk tours throughout project cycle	- Monthly reports on noise levels -Programme of serving equipment in place and used	Low 19,001,250ugx to change as per inflation
Dust pollution	Negative Impact	- Adhere to time of construction - Use water howitzers to dampen dust from the main Road to the UWA camp - Cover construction materials (in case sand, gravel, cement, will be mixed at the UWA camp etc) on transit and on site -Confine to core area	UWA/Operator Contractor	During construction but only at the current UWA camp	-Presence & use of dust dampening equipment -Reports on dust emissions	Low To be combined in the above cost
Change in population size, values and norms	Negative Impact	- Provide awareness to public on our norms and values - KNP management along with other security organs e.g. UPDF & Police to strengthen security -KNP management to participate in screening	UWA/Operator Districts Community Development Office -NGOs/CBOs	During construction	-Awareness programs in place and running	Low

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
		workers to weed out known poachers -UWA to raise awareness to workers in values of conservation -UWA to adhere to construction time -KNP management to enforce entry regulations				
Increased incidences of diseases and ill health	Negative Impact	- Provide awareness to workers on pathways HIV/AIDS & other diseases - Provide VCT centres -Provide protective gears -Provide education on stigma and all forms of discriminations associated with diseases	UWA/Operator Districts Community Development Office -NGOs/CBOs	Quarterly and as per as and when there is a need to respond or act accordingly	-Awareness program in place and running - VCT centres in place and used -Protective facilities for HIV/AIDS provided at work place	Low
Increased traffic levels	Negative Impact	- Adhere to construction time and schedule - Limit number vehicles on site to those for construction only -Avoid construction during high season -Process some of the materials outside for fixing on site	UWA/Operator Contractor	During construction	-Reports on vehicles in KNP Sebitoli zone & on site	Low

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
Incidences of risks, hazards and accidents	Negative Impact	- Contingency plan - Install and conduct regular check of firefighting equipment - Procedure to report on an incidence such as Root Cause Analysis Report - Provide first aid kit on site - Provide and enforce use of protective gears - Proper management of fuel dumps	UWA/Operator Contractor	Monthly through the project life cycle	- Reports on status of fire-fighting facilities, use of protective gear and - Contingency plan in place and use - Root Cause Analysis Report	Low
Waste management	Negative Impact	- KNP to develop own solid waste facility at the Sebitoli zone UWA camp and in the canopy walk itself - KNP management to consider planned canopy walks based on understood specific wildlife species behavior - KNP to enforce its LAU on roads - KNP to revise fees upwards for penalties for offences regarding off road driving	UWA/Operator Contractor	Throughout the project life cycle	- Waste management reports from UWA and KNP Sebitoli zone specifically - weight in kg/tones of the generated waste	Low

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
		-KNP to limit number of vehicles to the crater -KNP should consider alternative products apart from game viewing				
Change in habitat and species diversity	Negative Impact	-Treat all waste biologically and as relevant to the site to avoid any species to feed on them -Collect, sort, treat/dispose of waste generated properly -Abide to UWA waste management regulations -Conduct detailed assessment of the impact of waste on the species and habitat diversity along the Canopy Walk	UWA/Operator Contractor		-Daily/weekly/monthly ranger field data or tour guided data repositied at agreed repository after tours	Low
Wildlife harassment	Negative Impact	-To develop infrastructure and promote other products	UWA/Operator Contractor	During annual Environmental and Social Audit	Reports on attacks, animal population, behavior change or biological condition respectively	
Change in scenic value	Negative Impact	-Collect, sort, treat/dispose of solid/liquid waste properly -Abide to KNP waste management regulations & design a specific solid and	UWA/Operator Contractor	Every monthly reporting during operation	-Waste management report from KNP UWA detailing weights/tonnage	Low



Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
		human waste management plan in the Canopy Walk				
Increased incidences of diseases and ill health	Negative Impact	-Collect, sort, treat/dispose of solid/liquid waste properly -Abide to KNP waste management regulations & design a specific solid and human waste management plan in the Canopy Walk	UWA/Operator Districts Community Development Office -NGOs/CBOs	Monthly reporting and as and when there a need arises	Report from medical officer on HIV/AIDS status in Kabarole District -Reports on awareness campaigns on HIV/AIDS and other diseases e.g. Ebola, cholera etc.	Low
Change in the level of population	Negative Impact	-KNP to enforce entry regulations -Conduct campaigns on environmental education -KNP to limit number of vehicles to the Sebitoli zone -Kabarole District Local Government to enforce by-laws on conservation -Develop & encourage workers to form SACCOS -Housing of workers on the Canopy Walk to be managed under UWA accommodation guidelines	UWA	During operation		Low

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
Increased traffic levels	Negative Impact	-KNP management to revise upwards penalties for protected area offences -KNP management forecasts tourist numbers on the Canopy Walk -KNP management to commission detailed study on factors causing overcrowding in case of business picking up	KNP management	During operation		
Cost to community	Negative Impact	-Community Consultation and Participation -Skills Training and Capacity Building -Sustainable Funding Models: -Monitoring and Evaluation -Sensitization to communities on HIV/AIDS -Promotion of Community-Based Tourism Initiatives	UWA Kabarole District Local Government	During operation		
Incidences of risks and hazards	Negative Impact	-Proper disposal of solid waste -Stakeholder-engagement -Regulatory compliance -Regular inspections and maintenance	-UWA/Operator -UTB -Waste handler -MTWA -MGLSD	Once in three months		

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
		-Data sharing on the safety of the Canopy Walk with management -Emergency preparedness and Response towards wildlife behavior, -Risk Assessment & Management Plan -Visitor monitoring and Capacity management: -Visitor education and interpretation -Staff training and certification				
Compliance with the National Environment (Audit) Regulations, 2020	Negative Impact	Undertake Environmental & Social Audit as per its Regulation 3 sub regulation 1 - 2	UWA/Operator	Annually throughout the project life cycle		
Mitigation of the impacts associated with Decommissioning						
Change in scenic quality	Negative Impact	- Proper and timely payments of pension/terminal benefits of workers after services	UWA/Operator	Once in year during operation	-Report on environmental education to workers -Number of workers joining livelihood programs such as SACCOs	
Loss of employment	Negative Impact	Contractors during construction will use existing roads and there	UWA/Operator Contractor			

Identified positive / Negative Impact	Impact Sense	Enhancement / Mitigation Measures	Responsible Institution	Time frequency and of monitoring	Indicators	Rating & Relative cost (UgX) to change as per inflation of the time
		will be no any additional access route that will be added				
Dust pollution	Negative Impact	-Proper and timely payments of pension/terminal benefits of workers after services	UWA	During decommissioning on Sebitoli Zone main access road	-Report on dust pollution from KNP -Site visit to verify and report NEMA	Low
Change in life style and quality of life	Negative Impact	-Provide on job training for various trade and skills -Awareness on investment opportunities (e.g. SME activities)	-UWA -UTB -MTWA -NGOs -CBOs	Once during decommissioning	-Report on retrenchments from operator/ UWA	Low
Reduced benefits to communities and local economy	Negative Impact	-Provide on job training for various trade & tourism & skills -Awareness on investment opportunities (e.g. SME activities)	-UWA -UTB Kabarole District Local Government -NGOs -CBOs			

13 CONCLUSION

13.1 Conclusion

Tourism is now one of the world's largest and fastest growing economic sectors that have profound implications on global economic, social, cultural and environmental issues. In Uganda, tourism is much dependent on its abundant natural resources that make the country one of the mega-biodiverse countries in the world. Especially the Albertine region uniqueness harboring biological endemic, threatened, endangered species within the protected area conservation system. The conserved areas harbor unique biological species such as alpine plant life, wildlife that include mountain Gorilla, chimpanzee among other rich diversity of primate population, the forest elephants and buffalos, the birds, insects. Physically, Rwenzori mts, Lakes Albert, George, Edward, Rivers that include Mpanga, Kazinga channel, Ishasha, Semliki, its escarpment slopes that undulate into albertite rocks that harbor waxy hydrocarbons, culturally, the Batwa, Batooro, Bakonjo communities, the agricultural practices, the infrastructure among other interactions. Their management and monitoring of environment is therefore crucial for the sustainability of tourism in Uganda.

After the pandemic tourism numbers have been recorded increasing considerably which is attributed to improved tourist services in Uganda. The Sebitoli proposed CW-in-KNP is a pleasant investment as it has been thoroughly assessed with fewer highly negative impacts associated with construction, operation and decommissioning phases. This project aligns seamlessly with Uganda's tourism objectives, offering an exciting opportunity to enhance the country's natural attractions and promote eco-tourism. The forest canopy walk promises to provide visitors with a unique and immersive experience, allowing them to explore the rich biodiversity of Uganda's forests from an entirely new perspective. By embracing innovative tourism initiatives like this, UWA is confident in its ability to attract more visitors to Uganda while simultaneously conserving and showcasing the beauty of protected area landscapes.

The growth of the tourism sector is not isolated; it influences various other sectors such as construction, hotel management, infrastructure development, training institutions, tour operations, and more in Kabarole District. Additionally, the positive impact extends to communication, agriculture, security and health sectors. Consequently, the cumulative effect of tourism development on the country's economy is highly significant.

Despite this increase, tourism in Uganda faces challenges related to inadequate infrastructure. Therefore, the government has initiated the implementation of policies aimed at improving infrastructure. Additionally, the government is encouraging private sector investment in the sector and enhancing destination access.

The proposed Canopy Walk is planned to be situated in the Sebitoli Zone, overlooking the R. Mpanga and the Fort Portal – Kampala road, spanning a python-like length of 450 meters within the forest canopy. At full capacity, the Canopy Walk will accommodate a certain number of persons during operation.

Kibale National Park (KNP) is not only a prominent tourism site but also a crucial conservation area in Uganda. Its adjacent communities serve as a multi-use land area where communities derive their livelihoods



from extensive farming and production of food for domestic use. Therefore, conducting an Environmental and Social Impact Assessment (ESIA) is essential to assess the potential impacts and **integrate mitigation and enhancement measures throughout the project's lifecycle, including designing, construction, operation, and decommissioning.**

Several methods were employed in conducting this ESIA. These methods included consultation with various stakeholders, interviews, and focused group discussions with key stakeholders. Secondary data were collected from various sources in Kabarole District and Kampala, the capital city of Uganda. During the scoping phase, key concerns from stakeholders were gathered, project boundaries and alternatives were identified, and stakeholders were identified. This information has been integrated into this report. Visits were conducted to the project site in the Sebitoli zone.

Views and concerns from stakeholders have contributed to the analysis of the impacts and benefits of the proposed project. Some of these views and concerns are related to policy issues, while others pertain to environmental, economic, and social aspects associated with the proposed development. Additionally, there are concerns from international organizations regarding the implications of the proposed Canopy Walk development on the natural resources that have contributed to the conservation area status of KNP. Issues such as the potential impact of the Canopy Walk on wildlife and resources of exceptional value have been raised and addressed in this ESIA. The ESIA report proposes several enhancement options, mitigation measures, and project alternatives that could be considered to address some of the critical issues identified in the report.

Positive Impacts

The proposed CW-in-KNP development is likely to generate several positive impacts on both the local and national economies. Some of the significant positive impacts include the following:

Increased economic benefits are expected for local communities through the sale of goods and services, such as art and crafts products, during the construction and operation of the canopy walk.

Moreover, the national economy is projected to benefit from increased tax revenue and levies generated from tourism and hospitality services. Value-added tax (VAT) charges paid to Kabarole Local Government, particularly from nearby established accommodations, would significantly contribute to national revenue.

The project is also anticipated to create new employment opportunities, providing workers with additional income that can enhance their quality of life and support their families.

Additionally, the canopy walk development aligns with KNP and national policies by providing a modern tourism product. This supports the demand for a diverse range of services aimed at high-paying tourists, thus contributing to tourism development. The Economic and financial report indicated that all options are economically viable. The financial analysis report highlights that Option 1 and 2 are feasible at 30 USD per a tourist accessing the canopy walkway. The interest rate considered in the analysis is 8%. In addition, Option

3 and 4 are only feasible at 50 USD per tourist accessing the canopy walkway. Option 4 was preferred because of the increased length and the tower which will add on the tourist experience to the facility/area.

Enhancement measures

Several enhancement measures are proposed in order to ensure that the positive impacts are realized and sustained. Some of the measure includes:

- Implementing strategies to ensure linkage between the local economy and the canopy walk development. District Councils and other stakeholders should develop and implement policies aimed at improving the quality of goods and services through capacity building and training programs.
- Ensuring equal employment opportunities for all genders and prioritizing local communities with relevant skills, except for those skills and knowledge not available in the area.
- Government consideration of enhancing labor laws to mandate canopy walk operations to employ a specific proportion of the local workforce with the required skills.
- Development of an effective booking system by UWA and URA to control the number of visitors and facilitate revenue collection.
- Promotion of tourism locally and internationally by UWA to attract more tourists.
- Sensitization of local communities (the workers) and establishment of SACCOs by UWA and District Councils to provide assistance when need arises.

Negative Impacts

Some of the significant negative impacts associated with the proposed development include the following:

- Incompatibility with an outdated KNP-GMP regarding the location of the Canopy Walk. Updating the GMP will be necessary to implement the project's ESMP in collaboration with stakeholders.
- Change in habitat diversity may result from the python-like structure in the forest canopy.
- Wildlife harassment and increased disturbance levels may occur during the construction and operation of the canopy walk due to the presence of labor force (though limited) at the site.
- Changes in norms and values during operation may arise from alterations in incomes and the interaction of workers with people in the area.
- Increased risk of incidents, hazards, and accidents may occur due to wildlife attacks during construction.

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APPENDICES

Appendix 1: Approved NEMA TOR Approval Letter

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Appendix 2: Biodiversity Assessment Reports

Appendix 2 (a): Checklist of floral

Family	Species	Growth form	IUCN status	National Status	Footprint	Non-footprint
Acanthaceae	Acanthus arboreus	Shrub	LC	NA	1	1
Acanthaceae	Acanthus polystarchys	Shrub	NA	NA		1
Acanthaceae	Acanthus pubescens	Shrub	LC	NA		1
Acanthaceae	Justicia flava	Herb	NA	NA	1	1
Acanthaceae	Megaskepasma erythrochlamys	Herb	LC	NA		1
Amaranthaceae	Achyranthes aspera	Herb	LC	NA		1
Amaranthaceae	Cyathula prostrata	Herb	LC	NA	1	1
Amaryllidaceae	Scadoxus multiflorus	Herb	LC	NA	1	1
Anacardiaceae	Pseudospondias microcarpa	Tree	NA	NA		1
Annonaceae	Monodola myristica	Tree	LC	NA	1	1
Annonaceae	Uvariopsis congensis	Tree	LC	NA	1	1
Apiaceae	Centella asiatica	Herb	LC	NA		1
Apocynaceae	Funtumia africana	Tree	NA	NA	1	1
Apocynaceae	Funtumia elastica	Tree	LC	NA		1
Apocynaceae	Rauvolfia vomitoria	Tree	LC	NA	1	1
Apocynaceae	Tabernaemontana holstii	Tree	LC	NA	1	1
Apocynaceae	Tabernaemontana pachysiphon	Tree	LC	NA	1	1
Araceae	Culcasia scandens	Climber	NA	NA	1	1
Araliaceae	Hydrocotyle ranunculoides	Herb	LC	NA		1
Araliaceae	Polyscias fulva	Tree	NA	NA	1	1
Arecaceae	Phoenix reclinata	Tree	LC	NA		1
Aspleniaceae	Asplenium hypomelas	Herb	NA	NA	1	1
Aspleniaceae	Asplenium inaequilatera	Herb	NA	NA	1	1
Aspleniaceae	Asplenium unilaterale	Herb	NA	NA	1	1
Asteraceae	Aspiria africana	Herb	LC	NA		1
Asteraceae	Crassocephalum ventricosa	Herb	NA	NA		1
Asteraceae	Crassocephalum vitellinum	Herb	LC	NA		1

Asteraceae	Melanthera scandens	Herb	LC	NA		1
Asteraceae	Microglossa afzelii	Shrub	NA	NA		1
Asteraceae	Microglossa pyrifolia	Shrub	NA	NA		1
Asteraceae	Mikania micrantha	Shrub	NA	NA		1
Asteraceae	Senecio mannii	Shrub	LC	NA		1
Asteraceae	Vernonia amygdalina	Shrub	LC	NA	1	1
Asteraceae	Vernonia auriculifera	Shrub	LC	NA		1
Balsaminaceae	Impatiens niamniamensis	Shrub	LC	NA		1
Basellaceae	Basella alba	Herb	LC	NA	1	1
Begoniaceae	Begonia ampla	Climber	LC	NA	1	
Bignoniaceae	Kigeria africana	Tree	LC	NA		1
Bignoniaceae	Markhamia lutea	Tree	LC	NA	1	1
Bignoniaceae	Spathodea campanulata	Tree	LC	NA	1	1
Boraginaceae	Cordia abyssinica	Tree	LC	NA	1	1
Boraginaceae	Cordia africana	Tree	LC	NA	1	1
Boraginaceae	Cordia millenii	Tree	LC	NA		1
Boraginaceae	Cordia superba	Tree	LC	NA		1
Boraginaceae	Ehretia cymosa	Tree	LC	NA		1
Capparaceae	Capparis erythrocarpos	Shrub	LC	NA	1	1
Capparaceae	Capparis tomentosa	Shrub	LC	NA	1	1
Capparaceae	Euadenia eminens	Herb	NA	NA	1	1
Casuarinaceae	Casuarina equisetifolia	Tree	LC	NA	1	1
Chrysobalanaceae	Parinari excelsa	Tree	LC	NA		1
Commelinaceae	Commelina benghalensis	Herb	LC	NA		1
Commelinaceae	Palisota barteri	Herb	NA	NA	1	1
Commelinaceae	Palisota bracteosa	Herb	NA	NA	1	1
Commelinaceae	Palisota manii	Herb	LC	NA	1	1
Commelinaceae	Palisota schwenfurthii	Herb	LC	NA	1	1
Commelinaceae	Polia condensata	Herb	LC	NA	1	1
Connaraceae	Agelaea pentagyna	Liana	NA	NA	1	1
Convolvulaceae	Dichondra repens	Herb	NA	NA		1

Convolvulaceae	Ipomoea ariocarpa	Climber	NA	NA		1
Convolvulaceae	Ipomoea cairica	Climber	LC	NA		1
Convolvulaceae	Lepstemoni owariense	Climber	NA	NA	1	1
Cornaceae	Alangium salviifolium	Tree	NA	NA	1	1
Costaceae	Costus dubius	Herb	LC	NA	1	1
Cucurbitaceae	Coccinia sp	Climber	NA	NA		1
Cucurbitaceae	Diplocyclos palmatus	Climber	LC	NA	1	1
Cucurbitaceae	Memordica charantia	Climber	NA	NA		1
Cucurbitaceae	Memordica foetida	Climber	NA	NA	1	1
Cucurbitaceae	Momordica foetida	Climber	LC	NA	1	1
Cucurbitaceae	Mukia maderaspatana.	Herb	NA	NA		1
Cyperaceae	Cyperus papyrus	Sedge	LC	NA		1
Dryopteridaceae	Dryopteris manniana	Herb		NA		1
Ebenaceae	Diospyros abyssinica	Tree		NA	1	1
Ebenaceae	Diospyros mespiliformis	Tree	LC	NA	1	1
Euphorbiaceae	Acalypha neptunica	Shrub	NA	NA	1	1
Euphorbiaceae	Acalypha ornata	Shrub	NA	NA	1	1
Euphorbiaceae	Alchornea cordifolia	Shrub	LC	NA		1
Euphorbiaceae	Aleurites morucana	Tree	LC	NA	1	1
Euphorbiaceae	Argemuellera macrophylla	Shrub	NA	NA	1	1
Euphorbiaceae	Croton macrostachys	Tree	LC	NA	1	1
Euphorbiaceae	Croton megalocarpus	Tree	LC	NA	1	1
Euphorbiaceae	Drypetes bipindensis	Tree	LC	NA		1
Euphorbiaceae	Drypetes gerrardii	Tree	LC	NA	1	1
Euphorbiaceae	Erythrococca bongensis	Shrub	LC	NA	1	
Euphorbiaceae	Gymnanthes leonardii-crispi	Tree	LC	NA	1	1
Euphorbiaceae	Macaranga grandiflora	Tree	NA	NA		1
Euphorbiaceae	Neoboutonia macrocalyx	Tree	LC	NA	1	1
Euphorbiaceae	Shirakiopsis elliptica	Tree	LC	NA		1
Euphorbiaceae	Tetrorchidium didymostemon	Tree	LC	NA		1
Euphorbiaceae	Tragia brevispica	Climber	NA	NA	1	1
Fabaceae	Acacia pentagona	Shrub	LC	NA	1	1
Fabaceae	Albizia grandibracteata	Tree	LC	NA	1	1

Fabaceae	Centrocema pubescens	Climber	NA	NA		1
Fabaceae	Desmodium adescendens	Herb	LC	NA	1	1
Fabaceae	Desmodium incanum	Herb	LC	NA	1	1
Fabaceae	Desmodium uncinatum	Herb	LC	NA	1	1
Fabaceae	Dichrostarchys cinerea	Shrub	NA	NA	1	1
Fabaceae	Erythrina abyssinica	Tree	LC	NA	1	1
Fabaceae	Milletia dura	Shrub	NA	NA	1	1
Fabaceae	Neotonia wightii	Herb	NA	NA	1	1
Flacourtiaceae	Casearia battiscombei	Tree	LC	NA	1	1
Flacourtiaceae	Dovyalis macrocalyx	Shrub	LC	NA	1	1
Hypodematiaceae	Didymochlaena truncatula	Herb	LC	NA		1
Lamiaceae	Clerodendrum speciosissimum	Shrub	LC	NA		1
Lamiaceae	Hoslundia opposita	Shrub	LC	NA	1	1
Lamiaceae	Premna angolensis	Tree	NA	NA	1	
Lauraceae	Cassytha filiformis	Climber	LC	NA		1
Malvaceae	Dombeya wallichii	Shrub	LC	NA	1	1
Malvaceae	Hibiscus calyphyllus	Shrub	LC	NA		1
Marantaceae	Marantochloa purpurea	Herb	LC	NA	1	1
Melastomataceae	Tristemma mauritianum	Herb	LC	NA		1
Meliaceae	Carapa grandiflora	Tree	LC	NA		1
Meliaceae	Lepidotrichilia volkensii	Tree	LC	NA	1	1
Melanthaceae	Bersama abyssinica	Tree	LC	NA	1	1
Menispermaceae	Stephania abyssinica	Climber	NA	NA		1
Moraceae	Antiaris toxicaria	Tree	LC	NA	1	1
Moraceae	Ficus asperifolia	Shrub	LC	NA	1	1
Moraceae	Ficus brachypoda	Tree	LC	NA		1
Moraceae	Ficus conraui	Tree	LC	NA		1
Moraceae	Ficus cyathistipula	Tree	LC	NA		1
Moraceae	Ficus exasperata	Tree	LC	NA	1	1
Moraceae	Ficus mucoso	Tree	LC	NA		1
Moraceae	Ficus natalensis	Tree	LC	NA	1	1
Moraceae	Ficus ottoniifolia	Tree	LC	NA		1
Moraceae	Ficus sansibarica	Tree	LC	NA		1
Moraceae	Ficus saussureana	Tree	LC	NA		1
Moraceae	Ficus thonningii	Tree	LC	NA		1

Moraceae	Ficus trichopoda	Tree	LC	NA		1
Moraceae	Ficus vallis-choudae	Tree	LC	NA		1
Moraceae	Milicia excelsa	Tree	NT	EN	1	1
Moraceae	Treculia africana	Tree	NA	NA	1	
Moraceae	Trilepisium madagascariense	Tree	NA	NA		1
Myrsinaceae	Maesa lanceolata	Tree	LC	NA	1	1
Nephrolepidaceae	Nephrolepis biserrata	Fern	NA	NA		1
Olacaceae	Strombosia scheffleri	Tree	NA	NA	1	
Oleaceae	Chionanthus africanus	Tree	NA	NA		1
Oleaceae	Jasminum abyssinicum	Climber	LC	NA	1	1
Oleaceae	Olea welwitschii	Tree	LC	NA	1	1
Orchidaceae	Cyrtorchis monteiroae	Epiphyte	LC	NA	1	1
Ornagraceae	Jussiaea abyssinica	Herb	NA	NA		1
Osmundaceae	Osmunda regalis	Fern	NA	NA		1
Pandaceae	Microdesmis puberula	Shrub	NA	NA	1	1
Pandaceae	Micromelum pubescens	Shrub	NA	NA	1	
Passifloraceae	Adenia cissampeloides	Climber	NA	NA		1
Phyllanthaceae	Blideria micrantha	Tree	LC	NA		1
Phyllanthaceae	Phyllanthus nummulariifolia	Shrub	LC	NA		1
Phytolaccaceae	Hillieria latifolia	Herb	LC	NA	1	1
Phytolaccaceae	Phytolacca dodecandra	Shrub	NA	NA	1	1
Pinaceae	Pinus caribaea	Tree	LC	NA	1	1
Piperaceae	Piper betle	Herb	NA	NA	1	1
Piperaceae	Piper capensis	Herb	NA	NA	1	1
Piperaceae	Piper guineense	Climber	NA	NA	1	1
Piperaceae	Piper umbellatum	Herb	LC	NA	1	1
Poaceae	Hyperphenia rufa	Grass	LC	NA		1
Poaceae	Leptaspis zeylanica	Grass	NA	NA	1	1
Poaceae	Olyra latifolia	Grass	LC	NA	1	1
Poaceae	Oplismenus hirtellus	Grass	LC	NA	1	1
Poaceae	Panicum maximum	Grass	LC	NA	1	1
Poaceae	Paspalum germinatum	Grass	LC	NA	1	
Poaceae	Pennisetum purpureum	Grass	LC	NA	1	1

Poaceae	Setaria poiretiana	Grass	LC	NA		1
Polygonaceae	Persicaria setosula	Herb	LC	NA		1
Polypodiaceae	Microsorium punctatum	Fern	NA	NA	1	1
Polypodiaceae	Platyserium elephantotis.	Epiphyte	LC	NA	1	1
Ranunculaceae	Clematis hirsuta	Climber	NA	NA		1
Rhamnaceae	Gouania longispicata	Climber	NA	NA		1
Rhamnaceae	Maesopsis eminii	Tree	LC	NA	1	1
Rhamnaceae	Rhamnus prinoides	Shrub	LC	NA		1
Rhizophoraceae	Cassipourea molasana	Tree	NA	NA	1	
Rhizophoraceae	Cassipourea ruwensorensis	Tree	NA	NA	1	1
Rosaceae	Prunus africana	Tree	VU	VU	1	1
Rosaceae	Rubus apetalus	Shrub	NA	NA	1	1
Rosaceae	Rubus cordia	Shrub	NA	NA	1	
Rubiaceae	Coffea eugenioides	Tree	LC	NA	1	1
Rubiaceae	Coffea liberica	Shrub	NA	NA		1
Rubiaceae	Craterispermum laurinum	Shrub	NA	NA	1	
Rubiaceae	Dictyandra arborescens	Tree	NA	NA	1	1
Rubiaceae	Keetia gueinzii	Shrub	LC	NA		1
Rubiaceae	Mitragyna stipulosa	Tree	VU	VU		1
Rubiaceae	Oxyanthus speciosus	Tree	LC	NA		1
Rubiaceae	Rothmannia urcelliformis	Tree	NA	NA	1	
Rubiaceae	Vanguelia madagascariensis	Shrub	NA	NA	1	1
Rutaceae	Citropsis articulata	Tree	NA	NA	1	
Rutaceae	Clausena anisata	Shrub	LC	NA	1	1
Rutaceae	Toddalia asiatica	Climber	NA	NA	1	1
Rutaceae	Vepris nobilis	Tree	LC	NA	1	1
Rutaceae	Zanthoxylum angolensis	Tree	LC	VU		1
Rutaceae	Zanthoxylum gillettii	Tree	LC	VU	1	1
Sapindaceae	Allophylus abyssinicus	Shrub	LC	NA	1	1
Sapindaceae	Allophylus cobbe	Shrub	NA	NA	1	1
Sapindaceae	Aphania senegalensis	Tree	LC	NA	1	1
Sapindaceae	Blighia unijugata	Tree	LC	NA	1	1
Sapindaceae	Cardiospermum grandiflorum	Climber	NA	NA	1	1
Sapindaceae	Pancovia turbinata	Tree	LC	NA	1	1

Sapindaceae	Paullinia pinnata	Climber	NA	NA	1	1
Sapotaceae	Aningeria altissima	Tree	CD	NA	1	1
Sapotaceae	Chrysophyllum gorungosanum	Tree	NA	NA		1
Sapotaceae	Mimusops bagshawei	Tree	NA	NA	1	1
Solanaceae	Cestrum nocturnum	Shrub	LC	NA	1	1
Solanaceae	Dutara sauveolens	Shrub	EW	NA	1	1
Solanaceae	Solanum mauritianum	Shrub	LC	NA		1
Sterculiaceae	Dombeya kirkii	Tree	NA	NA	1	1
Sterculiaceae	Dombeya mukole	Tree	NA	NA	1	1
Tectariaceae	Tectaria gemmifera	Fern	NA	NA	1	1
Thelypteridaceae	Christella parasitica	Fern	NA	NA		1
Tiliaceae	Glyphaea brevis	Tree	LC	NA	1	1
Ulmaceae	Celtis adolfi-friderici	Tree	LC	NA		1
Ulmaceae	Celtis africana	Tree	LC	NA	1	1
Ulmaceae	Celtis durandii	Tree	LC	NA	1	1
Ulmaceae	Celtis gomphophylla	Tree	LC	NA		1
Ulmaceae	Celtis zenkeri	Tree	LC	NA		1
Ulmaceae	Celtis philippensis	Tree	LC	NA		1
Ulmaceae	Chaetacme aristata	Shrub	LC	NA	1	1
Ulmaceae	Trema orientalis	Tree	LC	NA	1	1
Urticaceae	Myrianthus arboreus	Shrub	LC	NA		1
Urticaceae	Pouzolzia parasitica	Herb	LC	NA	1	1
Verbanaceae	Clerodendrum silvanum	Liana	LC	NA		1
Verbenaceae	Lantana camara	Shrub	NA	NA	1	1
Zingiberaceae	Aframomum angustifolium	Herb	NA	NA		1
Zingiberaceae	Aframomum mildbraedii	Herb	NA	NA		1

Appendix 2 (b): Checklist of mammals

Order	Family	Species	Evidence
Primate	Pongidae	Common Chimpanzee <i>Pan troglodytes</i>	Nests, fecal & Interviews
	Cercopithecidae	Black and White Colobus <i>Colobus guereza</i>	Foraging groups and Camera trap
		Red Colobus <i>Piliocolobus badius</i>	Foraging groups
		Red Tailed Monkey <i>Cercopithecus ascanius</i>	Foraging groups
		Olive Baboon <i>Papio Anubis</i>	Foraging groups
		Grey-cheeked Mangabey <i>Lophocebus albigena</i>	Foraging groups
		Vervet Monkey <i>Chlorocercus pygerythrus</i>	Interviews
Artiodactyla	Elephantidae	Elephant <i>Loxodonta africana</i>	Dung, Trails, Audio and Camera trap
	Bovidae	Bushbuck <i>Tragelaphus scriptus</i>	Camera trap and Dung
		Black fronted Duiker <i>Cephalophus nigrifrons</i>	Camera trap and Dung
		Blue Duiker <i>Philantomba monticola</i>	Camera trap and Dung
		Bush Duiker <i>Sylvicapra grimmia</i>	Camera trap
		Buffalo <i>Syncerus cafer</i>	Interviews
	Suidae	Bushpig <i>Potamochoerus porcus</i>	Interviews
		Giant Forest hog <i>Hylochoerus meinertzhageni</i>	Interviews
Carnivora	Herpestidae	Banded Mongoose <i>Mungos mungo</i>	Interviews
		Marsh Mongoose <i>Atilax paludinosus</i>	Camera trap
	Viveridae	Servaline Genet <i>Genetta genetta</i>	Camera trap
	Felidae	Leopard <i>Panthera pardus</i>	Interviews
		Serval <i>Leptailurus serval</i>	Interviews

Appendix 2 (c): Checklist of Birds

Atlas Number	Species	R A	Notes	EA-Threat	Habitat
107	Little Sparrowhawk <i>Accipiter minullus</i>	1	R(B)?		f
118	Wahlberg's Eagle <i>Aquila wahlbergi</i>	1	AfM /NB, RB		f
138	Black Kite <i>Milvus migrans</i>	1	RB, PM		
140	European Honey-buzzard <i>Pernis apivorus</i>	1	OW		F
346	Banded Prinia <i>Prinia bairdii</i>	4	RB		F
350	Red-eyed Dove <i>Streptopelia semitorquata</i>	2	RB		f
358	African Green-Pigeon <i>Treron calva</i>	4	RB		F
372	Great Blue Turaco <i>Corythaeola cristata</i>	6	RB		F
377	Ross's Turaco <i>Musophaga rossae</i>	2	RB		F
384	Black-billed Turaco <i>Tauraco schuetti</i>	2	RB		FF
385	Dusky Long-tailed Cuckoo <i>Cercococyx mechowii</i>	1	R(B)		FF
389	African Emerald Cuckoo <i>Chrysococyx cupreus</i>	1	RB?		F
			RB, AfM		
399	Red-chested Cuckoo <i>Cuculus solitarius</i>	1	/NB?		F
401	Yellowbill <i>Ceuthmochares aereus</i>	1	RB		F
403	Black Cuckoo <i>Centropus grilli</i>	1	RB	R-NT	Af/FF
406	White-browed Coucal <i>Centropus superciliosus</i>	1	RB		
447	White-rumped Swift <i>Apus caffer</i>	4	RB		
452	African Palm Swift <i>Cypsiurus parvus</i>	2	RB		
459	Speckled Mousebird <i>Colius striatus</i>	4	RB		
474	Blue-breasted Kingfisher <i>Halcyon malimbica</i>	1	RB		FW
488	Cinnamon-chested Bee-eater <i>Merops oreobates</i>	4	RB	R-RR	F
503	White-headed Woodhoopoe <i>Phoeniculus bollei</i>	7	RB		FF
	Black-and-white-casqued Hornbill <i>Bycanistes</i>				
513	<i>subcylindricus</i>	4	RB		F
529	Yellow-spotted Barbet <i>Buccanodon duchaillui</i>	2	RB		FF
533	Gray-throated Barbet <i>Gymnobucco bonapartei</i>	14	RB		F
538	Hairy-breasted Barbet <i>Tricholaema hirsuta</i>	1	RB		F
548	Yellow-rumped Tinkerbird <i>Pogoniulus bilineatus</i>	1	RB		FF
549	Yellow-rumped Tinkerbird <i>Pogoniulus bilineatus</i>	2	RB		F
553	Speckled Tinkerbird <i>Pogoniulus scolopaceus</i>	1	RB		F
555	Yellow-throated Tinkerbird <i>Pogoniulus subsulphureus</i>	2	RB		F
566	Lesser Honeyguide <i>Indicator minor</i>	1	RB		f
	Speckle-breasted Woodpecker <i>Dendropicos</i>				
587	<i>poecilolaemus</i>	2	RB		
647	Western Black-headed Oriole <i>Oriolus brachyrhynchus</i>	2	RB		F
674	Scaly-breasted Illadopsis <i>Illadopsis albipectus</i>	2	RB		FF
675	Brown Illadopsis <i>Illadopsis fulvescens</i>	2	RB		FF
689	Petit's Cuckooshrike <i>Campephaga petiti</i>	1	RB		FF

Atlas Number	Species	R A	Notes	EA-Threat	Habitat
698	Slender-billed Greenbul <i>Andropadus gracilirostris</i>	1	RB		FF
699	Little-grey Greenbul <i>Andropadus gracilis</i>	1	RB	R-NT	FF
701	Yellow-whiskered Greenbul <i>Andropadus latirostris</i>	8	RB		F
705	Little Greenbul <i>Andropadus virens</i>	2	RB		F
706	Honeyguide Greenbul <i>Baeopogon indicator</i>	2	R(B)		FF
708	Red-tailed Bristlebill <i>Bleda syndactyla</i>	2	RB		FF
716	Western Nicator <i>Micator chloris</i>	2	RB		F
719	Toro Olive-Greenbul <i>Phyllastrephus hypochloris</i>	2	RB	R-VU/RR	FF
732	Common Bulbul <i>Pycnonotus barbatus</i>	3	RB		f
734	Fire-crested Alethe <i>Alethe diadenmata</i>	1	RB		FF
743	Brown-backed Scrub-Robin <i>Cercotrichas hartlaubi</i>	2	RB		f
750	Blue-shouldered Robin-Chat <i>Cossypha cyanocampter</i>	2	RB		F
773	Red-tailed Ant-Thrush <i>Neocossyphus rufus</i>	1	RB		FF
790	Rufous Flycatcher-Thrush <i>Stizorhina fraseri</i>	2	RB		FF
815	Masked Apalis <i>Apalis binotata</i>	1	RB		FF
817	Gray Apalis <i>Apalis cinerea</i>	2	R(B)		FF
826	Buff-throated Apalis <i>Apalis rufogularis</i>	3	RB		FF
829	Black-faced Rufous-Warbler <i>Bathmocercus rufus</i>	2	RB		FF
837	Grey-backed Camaroptera <i>Camaroptera brachyura</i>	3	RB		f
838	Olive-green Camaroptera <i>Camaroptera chloronota</i>	2	RB		FF
855	Chubb's Cisticola <i>Cisticola chubbi</i>	4	RB		FW
857	Red-faced Cisticola <i>Cisticola erythrops</i>	1	RB		W
875	Gray-capped Warbler <i>Eminia lepida</i>	2	RB	R-RR	fWW
889	Green Hylia <i>Hylia australis</i>	2	RB		F
908	Willow Warbler <i>Phylloscopus trochilus</i>	1	WV, PM		f
911	White-chinned Prinia <i>Prinia leucopogon</i>	6	RB		F
924	Green Crombec <i>Sylvietta virens</i>	2	RB		F
936	African Dusky Flycatcher <i>Muscicapa adusta</i>	1	RB		F
936	African Dusky Flycatcher <i>Muscicapa adusta</i>	1	RB		F
940	Dusky-blue Flycatcher <i>Muscicapacomitata</i>	1	RB		F
942	Grey-throated Flycatcher <i>Myioparus griseigularis</i>	1	RB		FF
946	Lead-colored Flycatcher <i>Myioparus plumbeus</i>	2	RB		f
955	Black-and-white Shrike-flycatcher <i>Bias musicus</i>	1	RB		f
957	Jameson's Wattle-eye <i>Dyaphorophya jamesoni</i>	1	RB		FF
958	Chestnut Wattle-eye <i>Dyaphorophya castanea</i>	3	RB		FF
960	Brown-throated Wattle-eye <i>Platysteira cyanea</i>	2	RB		f
963	African Blue Flycatcher <i>Elminia longicauda</i>	2	RB		f
967	Red-Bellied Paradise-Flycatcher <i>Terpsiphone rufiventer</i>	1	RB		F
1000	Northern Puffback <i>Dryoscopus gambensis</i>	2	RB		F

Atlas Number	Species	R A	Notes	EA- Threat	Habit at
1008	Lühder's Bushshrike <i>Laniarius luehderi</i>	2	RB		F
1013	Bocage's Bushshrike <i>Malaconotus bcagei</i>	2	RB		F
1017	Many-colored Bushshrike <i>Malaconotus multicolor</i>	1	RB		FF
1022	Brown-crowned Tchagra <i>Tchagra australis</i>	2	RB		
1058	Purple-headed Starling <i>Lamprotornis purpureiceps</i>	9	RB AfM/NB		F
1061	Splendid Starling <i>Lamprotornis splendidus</i>	4	RB		F
1069	Narrow-tailed Starling <i>Poeoptera lugubris</i>	10	RB(?)		FF
1080	Collared Sunbird <i>Hedypna collaris</i>	4	RB		F
1087	Green Sunbird <i>Anthreptes rectirostris</i>	2	RB		FF
1094	Olive-bellied Sunbird <i>Cinnyris chloropygia</i>	4	RB		F
1097	Blue-throated Brown Sunbird <i>Cyanomitra cyanolaema</i>	2	RB		FF
1112	Olive Sunbird <i>Cyanomitra olivacea</i>	2	RB		FF
1120	Green-throated Sunbird <i>Chalcomitra rubescens</i>	1	RB		F
1122	Scarlet-chested Sunbird <i>Chalcomitra senegalensis</i>	1	RB		f
1130	Green-headed Sunbird <i>Cyanomitra verticalis</i>	1	RB		F
1133	Yellow White-Eye <i>Zosterops senegalensis</i>	3	RB		f
1161	Dark-backed Weaver <i>Ploceus bicolor</i>	1	RB		F
1165	Black-headed Weaver <i>Ploceus cucullatus</i>	4	RB		
1169	Brown-capped Weaver <i>Ploceus insignis</i>	1	RB		F
1176	Black-necked Weaver <i>Ploceus nigricollis</i>	3	RB		f
1186	Yellow-mantled Weaver <i>Ploceus tricolor</i>	2	RB		FF
1230	Black-crowned Waxbill <i>Estrilda nonnula</i>	1	RB		f
1246	Grey-headed Negrofinch <i>Nigrita canicapilla</i>	2	RB		F
1247	White-breasted Negrofinch <i>Nigrita fusconota</i>	2	RB		F
1259	Red-headed Bluebill <i>Spermophaga ruficapilla</i>	1	RB		F
1266	Bronze Mannikin <i>Lonchura cucullata</i>	2	RB		
1290	Yellow-fronted Canary <i>Serinus mozambicus</i>	1	RB		

Appendix 2 (d): Checklist of amphibians and reptiles

Amphibians Species list

Anura, Bufonidae

Bufo funereus

Bufo kisoensis

*Bufo maculatus*¹

Hyperoliidae, Hyperoliinae

Hyperolius cinnamomeoventris

Hyperolius kivuensis

Hyperolius lateralis

Hyperolius nasutus

Hyperolius platyceps

*Hyperolius viridiflavus*⁵

Kassininae

Afraxalus laevis

Afraxalus quadrivittatus

Phlyctimantis verrucosus

Leptopelis christyi

Leptopelis kivuensis

Pipidae

Xenopus laevis

Xenopus vestitus

Xenopus wittei

Ranidae

Schoutedenella schubotzi

Phrynobatrachus auritus

Phrynobatrachus dendrobates

Phrynobatrachus graueri

*Phrynobatrachus parvulus*⁷

Phrynobatrachus versicolor

Hylarana albolabris

Ptychadena chrysogaster

Ptychadena mascareniensis

*Rana angolensis*⁸

Rhacophoridae

Chiromantis rufescens

Reptile species list

Squamata, Agamadae

Agama atricollis

Chamaeleonidae

Chamaeleo adolfifridrici

Chamaeleo ellioti

Chamaeleo ituriensis

Rhampoleon boulengeri



Gekkonidae

Cnemapsi quattuorseriatus
Hemidactylus mabouia

Lacertidae

Adolfus africanus
Adolfus vauereselli
Holoaspis guentheri

Scincidae

Lygosoma fernandi
Leptosiphos aloysiisabaudiae
Mabuya maculilabris
Mabuya megalura
Mabuya striata

Serpentes

Boidae

Python sebae

Colubridae

Boiga blandingii
Boiga pulverulenta
Bothrophthalmus lineatus
Crotaphopeltis hotamboeia
Dasypeltis atra
Dipsadoboa unicolor
Duberria lutrix
Geodipsas depressiceps
Hapsidophrys lineatus
Lamprophis lineatus
Lamprophis olivaceus
Lycophidion oratum
Mehelya stenophthalmus
Natriciteres olivacea
Philothamnus angolensis
Philothamnus carinatus
Philothamnus heterodermus
Philothamnus nitidus
Philothamnus semivariatus
Polemon christyi
Psammophis phillipsii
Rhamnophis aethiopissa
Thelotornis kirtlandii
Thrasops jacksonii

Elapidae

Dendroaspis jamesonii
Naja melanoleuca

Typhlopidae

Typhlops angolensis

Viperidae

Atheris nitschei

Atheris squamiger

Bitis nasicornis

Causus lichtenstienii

Totals: 28 Amphibians and 47 Reptile species

Specific to Sebitoli Tourism Sector: 8 Amphibians and 2 Reptiles species were recorded according to previous studies in Sebitoli Tourism Sector

Appendix 3: Stakeholder Consultations

Appendix 3 (a): List of consulted and engaged persons

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ATTENDANCE REGISTER

Date: 19th 1-2024 Venue: Kabarole District HQS

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

NO	NAME AND SURNAME	Gender	DESIGNATION/ POSITION	CONTACT INFO	SIGNATURE
1	Babaluba Swabwa	M	D/CAO	0772367274	[Signature]
2	KANYIGINTA FUNKE	F	SEO	0772369564	[Signature]
3	NADINE BASSONAH	F	SOXI	0772645249	[Signature]
4	Bagina Deborah	F	Tourism Officer	0772934988	[Signature]
5	Mirembe Clif	M	DISTRICT LABOUR OFFICER	0782167343	[Signature]
6	Nantaba Silvia	F	Sociologist	0752635499	[Signature]
7	Ruyonga Kenneth	M	Physical planner	0783847916	[Signature]
8	Banyana Kateresa	M	EIA Team leader	0782700876	[Signature]
(9)	Cecilia Migisha	M	Canopy Architect	0704633663	[Signature]

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ATTENDANCE REGISTER

Date: 20th 1-2024 Venue: Busiro S. County HQS

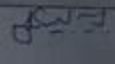
Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

NO	NAME AND SURNAME	Gender	DESIGNATION/ POSITION	CONTACT INFO	SIGNATURE
1	Lilian Kapumba	F	SAC	0712547366	[Signature]

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ATTENDANCE REGISTER

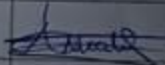
Date:	19 th - 1 - 2024	Venue:	Sunga Station
Meeting Title	Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park		

NO	NAME AND SURNAME	Gender	DESIGNATION/ POSITION	CONTACT INFO	SIGNATURE
1	EDISON NJWAMANYA	M	CHIEF WATIDEN	edison-njwamanya@gmail.com	

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ATTENDANCE REGISTER

Date:	21 st - 1 - 2024	Venue:	Noah's Ark Campsite & Restaurant
Meeting Title	Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park		

NO	NAME AND SURNAME	Gender	DESIGNATION/ POSITION	CONTACT INFO	SIGNATURE
01	Atangichwa Xbali	M	Owner Tourguide	077293248	

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ATTENDANCE REGISTER

Date: 22nd 1-2024 Venue: Group members Home

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

Sebitoli Womens Conservation & Cultural Group (CWCCG)

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
1	BIRUNGU MARGRETT MARI	F	CLP	SEBITOLI A	0705003404 0789752084	Murungi
2	Mbabaizi Beatrice	F	member	sebitoli A	0788812296	mb
3	Kabakakale A	F	member	sebitoli	0783977054	KA
4	Zaituni, Catherine	F	Member	Sebitoli	0708966074	del
5	Zaituni Amisi	F	Member	Sebitoli	0784788338	del
6	Ryomunabye Pashasi	F	member	Sebitoli	0789992272 0782290833	pashas
7	Asimwe TUKO JOCKLINE	F	Treasurer	Sebitoli	0705973981	Asimwe

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ATTENDANCE REGISTER

Date: 23rd 1-2024 Venue: Community members Compound

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

LC1 CHAIRPERSON
SEBITOLI A VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 21.01.2024

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
8	MAJIRI KALLOMUKO	F		SEBITOLI		K.m.
9	BIRUNGU MARGRETT MARI	F	N.H.T	SEBITOLI	0705003404 0789752084	Murungi
10	KIIZA VIOLET	F	member	SEBITOLI		K.V
11	Murungi Brian	M	Member	Sebitoli	0779520455	del
12	Tibanazuka Joyce	F	Member	Sebitoli		TJ
13	Kemigisa Oliver	F	Member	Sebitoli	0760761612	del
14	Kakito Sarah	F	member	Sebitoli	0788838965	del
15	KOMUTIMBO FLORENCE	F	member	Sebitoli	0774404265	
16	MUGABO ROBERT	M	Member	Sebitoli	0757328081	
17	Komukendo Tadeo	F	member	Sebitoli		
18	ASABA JOHN	M	member			
19	NYAKANA IBRAHIM	M	member			0756312275

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ATTENDANCE REGISTER

LC1 CHAIRPERSON
SEBITOLI A VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 21.01.2024

Date: 21/1/2024 Venue: Community member's compound

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
22	Rwamabano Goret	F	Farmer	Sebitoli	0785050719	
23	FATUMA TOPISTA	F	member	Sebitoli	—	—
24	GUMFIRI ZA JOSEPH	M	member	Sebitoli	—	—
25	AHEERWA AMOS	M	MEMBER	Sebitoli	—	AA
26	ALICWAMU MOSES	M	MEMBER	Sebitoli	—	AA
27	Bagonza Y.	M	MEMBER	Sebitoli	—	Bagonza
28	KOBOSINGE CISSY	F	MEMBER	Sebitoli	0762071056	—

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ATTENDANCE REGISTER

Date: 21st 1-2024 Venue: Community members residence

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

LC1 CHAIRPERSON
SEBITOLI A VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 21st 01. 2024

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
1	TUGUME NELSON	M	C/P LC1	SEBITOLI KIX	0751480904 0796102376	[Signature]
2	Kalamuc. Kionjale	M		SEBITOLI A	0753862062 0764633658	[Signature]
3	MONDAY S	M	g/p LC1	DWA		[Signature]
4	Wapko Isam. A	M		Sebitoli	0702382728	[Signature]
5	KINENE RICHARD	M	DEFENCE	SEBITOLI	0701919315	[Signature]
6	Musumbano	J		SEBITOLI		[Signature]
7	Musinguzi BADA M	M		SEBITOLI	0779018020	[Signature]
8	KABATALYA MARY	F				

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LC1 CHAIRPERSON
SEBITOLI A VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 21-01-2024

ATTENDANCE REGISTER

Date: 21/1/2024 Venue: Community member's Compound

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
	TUSIME Immaculate	F		SEBITOLI	077346624	
	AMOS MULAMUZI	M		UEBITU	0773963037	
	Kyapfweenen	M		Sebitoli	0771293142	
	Byanhangari	M		Sebitoli	07744379195	
	Musime Jolly	F		Sebitoli	07586402	
	Musime ZIMALE	M		SEBITOLI		
	Kandace Pi	F		Sebitoli		
	Komuhangi Teopato	TK		Sebitoli		
	MUGISHA Priscilla	M	member	Sebitoli B		

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ATTENDANCE REGISTER

Date: 21/1/2024 Venue: Community member's Compound

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

LC1 CHAIRPERSON
SEBITOLI A VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 21.01.2024

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
15	Kanungi Sarah	F	member	Sebitoli	075669494	S
16	Twinahwezi Annet	F	member	Sebitoli	07541452	An
17	Ainembabazi Catherine	F	Member	Sebitoli	07519293	Cathy
18	Muganyi	FM	Member	Sebitoli	0789935065	
19	Kiiriza	FM	SLK	Sebitoli		
20	Koojo JOHN	M	Researcher	Sebitoli	0754952439	John
21	ASIMWE PETER	M	Farmer	Sebitoli	0744379372	Pm
22	Bingi Tadeo	M		Sebitoli		Bingi
23	Egwa	M				
24	ATEBALE HENRY ALPHA	M				
25	AGUMA KAIJA	F				
26	KABAGENTI JANE	F				

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ATTENDANCE REGISTER

Date: 21/1/2024 Venue: Community member's Compound

Meeting Title: Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park

LC1 CHAIRPERSON
SEBITOLI A VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 21.01.2024

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
	KATEGIKA ESKIMO	Male		Sebitoli	077107979	Esimo
	KATUSE PHIONAH	Female		Sebitoli	0761174322	Katuse
	KIRUNGU MOREEN	Female		Sebitoli		Moreen
	ATUZABIRWE Immaculete	Female		Sebitoli		Immaculete
	Kabajuni Peluce	Female		Sebitoli		Peluce
	Kyakya Peluce	Female		Sebitoli		Peluce
	Kabagentyi Jane	Female		Sebitoli		Jane
	Tibagasa J.	Female		Sebitoli		Tibagasa
	FRANCIS EXAVIOR			Sebitoli		Francis

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LCT CHAIRPERSON
 SEBITOLI A VILLAGE
 KASWA PARISH
 BUSORO SUBCOUNTY
 KABAROLE DISTRICT
 Date: 21.01.2024

ATTENDANCE REGISTER

Date:	21/1/2024	Venue:	Community members' Compound
Meeting Title:	Stakeholder engagement during Environmental and Social Impact Assessment Study for a proposed Canopy Walk in Sebitoli Sector in Kibale National Park		

NO	NAME AND SURNAME	Gender	POSITION	VILLAGE	CONTACT INFO	SIGNATURE
	Kwanga Lho Clinton	M	Member	Sebitoli	0758547092	
	Musabe James	m	member	Sebitoli B	0762340052	
	Zaituni Kahwene	F	member	Sebitoli A	0788660702	
	Zaituni Amisi	f	Member	Sebitoli A	0784758558	
	Mugesi Patrick	M	member	Sebitoli B	0773041628	
	Burunga Daniela	F	Secretary	Sebitoli A	079198279	
	Bahiti A	M			0760135200	
	Nuwababa Bosco	M	Member	SEBITOLI A	076074517	
	Murungi Robert	M				
	Night Margaret	F	member	Sebitoli	0780266876	

Appendix 3 (b): Sebitoli Local Council I Letter of no objection and a copy of wild animal raids assessment/report from the LC1 Executive

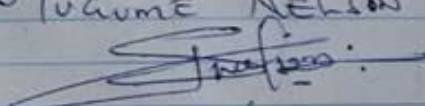
SEBITOLI 'A' VILLAGE
KASWA PARISH
BUSORO SUB-COUNTY
KABAROLE DISTRICT
20th. 01. 2024

TO NEMA

STAKE HOLDER ENGAGEMENT.

As the Community of Sebitoli 'A' village, we have been Consulted about the proposed Canopy walk. We have no objection to the project ~~the~~ but we are requesting to be employed in the project and to be helped to benefit from the tourists who will come. We are requesting UWA to work with as the community and the subcounty to manage the wild-animal raids. UWA should also compensate those who people whose crops were destroyed by wild animals and families who lost members. We look forward to the project.

Thank you!

Yours in Service
TUGUME NELSON c/man


0785102378 / 0751485904.

 LC1 CHAIRPERSON
SEBITOLI 'A' VILLAGE
KASWA PARISH
BUSORO SUBCOUNTY
KABAROLE DISTRICT
Date: 20th. 01. 2024

TEL: 0755268006

Email: joramruharo@gmail.com

Our Ref:

Your Ref:



THE REPUBLIC OF UGANDA

Office of the Agriculture Officer,
Busoro Sub County,
P.O. Box 38, Fort Portal.

Date: 23rd June 2023.

The Sub County Chief Busoro.

RE: TECHNICAL REPORT ON ASSESSMENT AND VALUATION OF SEBITOLI A AND SEBITOLI B FARMERS'S CROPS DAMAGED BY WILD ANIMALS FROM KIBALE NATIONAL PARK:

Following several reports from the area LC1 chairpersons of Sebitoli A and B, and grievances directly from farmers during field trainings, about destruction of crops by wild animals, an assessment and valuation of crops of the affected farmers was called out in both two villages. It is from this background that I am presenting in this report, the findings from the assessment and valuation of Crops damaged by wild animals from Kibale National Park, as a response to reports from LC1 chairpersons. The assessment was conducted on Monday 15th June 2023 with the guidance of the LC1 chairperson Sebitoli A.

Observation:

The extent of crop damage was assessed and valuation costs made in reference to the *Kabarole District Land Board Compensation Rates for Financial Year 2019/2020* and the results are as summarized in the table below:

S/N	Farmer's name	Crop	Extent of damage (%)	Rate/acre	Quantity (acres)	Amount
1.	Tugume Nelson	Irish potatoes	50	3,000,000/=	2	3,000,000/=
2.	Tumusiime John	Maize	75	1,500,000/=	0.5	562,000/=
		Beans	50	1,800,000/=	0.5	450,000/=
3.	Nyakato Annet	Maize	30	1,500,000/=	2	900,000/=
		Beans	25	1,800,000/=	2	900,000/=
4.	Eribankya	Maize	50	1,500,000/=	0.5	375,000/=
		Beans	50	1,800,000/=	0.5	45,000/=
5.	Agaba Jame	Maize	50	1,500,000/=	0.25	187,500/=
		Beans	45	1,800,000/=	0.25	202,500/=
6.	Niwagaba Johnbosco	Irish potatoes	40	3,000,000/=	0.5	600,000/=
		Maize	50	1,500,000/=	0.25	187,500/=
		Beans	45	1,800,000/=	0.25	202,500/=
7.	Kabwimukya Majiri	Beans	90	1,800,000/=	0.25	405,000/=
8.	Kyapa Stehene	Ground nuts	85	2,500,000/=	0.5	1,062,500/=
		Beans	85	1,800,000/=	0.5	765,000/=
9.	Madida Silver	Maize	75	1,500,000/=	0.25	281,250/=
10.	Amis Musa	Banana	95	20,000/clump	25clumps	475,000/=
		maize	95	1,500,000/=	0.25	356,250/=

From the above findings, the affected farmers have made a loss equivalent to the amount indicated in the above table which they may be compensated.

Some of the pictures of the affected gardens



Irish potato fields destroyed by elephants



Beans and maize destroyed by the elephant.

Compiled by

RUHARO YORAM,
Agriculture Officer.

CC: LCIII Chairperson Busoro S/C
CC: Chairperson Sebitoi A
CC: Chairperson Sebitoi B