RWENZORI MOUNTAINS NATIONAL PARK, UGANDA (N684)

Uganda Wildlife Authority report of October, 2019

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STATE OF CONSERVATION REPORT FOR RWENZORI MOUNTAINS NATIONAL PARK - UGANDA

Submitted to the **World Heritage Centre, UNESCO**

October 15, 2019

1. INTRODUCTION

Rwenzori mountains National Park (RMNP) World Heritage Property (number 684) is located in Uganda. It's a Natural property, was inscribed on the world heritage list in 1994.

2. EXECUTIVE SUMMARY

The Rwenzori Mountains National Park is World Heritage Property number 684 is a natural property located in Uganda. RMNP was inscribed as a World Heritage Site in 1994.

Following the 42nd World Heritage (WH) Committee Conference in Manana in June 2018, a number of decisions were generated with Decision 42COM 7B.95 particularly focusing on issues that are likely to affect the maintenance of Outstanding Universal values of RMNP. These issues included the need for continued coordinated patrols with the Democratic Republic of Congo (DRC), allegation that Copper Mining at Kilembe could be impacting the general environment including the Virunga National Park WH property, the need to adopt the standard line transect while undertaking the Chimpanzee census, the impacts of the cable car project to the site, impacts resulting from development of Sindila and Nyamwamba hydropower (HEP) and the need for conduction of elephant census.

Uganda undertook to address the above issues raised by the 42nd WH Committee through Continued coordinated patrols with DRC, undertook investigation of the impacts of the mines and ruled out any significant impacts caused by the derelict mines at Kilembe on the environment. Monitoring activities have also indicated that there are no impacts created by the establishment of Sindila and Nyamwamba HEP projects. Uganda would also wish to confirm that nothing is yet implemented on ground in respect to the Cable

car project and commits to share every information pertaining to this development with the stakeholders at every stage of development. It should also be noted that Uganda has committed funds to conduct the census for both the elephant and the Chimpanzee in its 2019/2020 FY. This report further highlights some key activities which have been undertaken to implement the newly approved General Management Plan.

Other conservation issues that have a likelihood of affecting the Outstanding Universal values of the property have been highlighted as Financial sustainability, wild fires, increasing human population and climate change. A number of mitigation measure that are being implemented on site to control the impacts of these aspects have been highlighted herein including marketing of the site, strategic planning, improvement of tourism infrastructure, fire management planning and implementation, involvement of communities in site management, payment for ecosystem services, river bank protection and management plus restoration/ vegetation of the buffer area.

In respect to conformity with Paragraph 172 of the operational Guidelines to the UNESCO Convention, Uganda has no intentions to neither change the boundaries of the property nor develop major infrastructure related to site management that may negatively impact the property's Outstanding Universal values, its authenticity and integrity.

In general terms, the site values, integrity and site protection are all being addressed.

3. RESPONSES TO DECISION 42COM 7B.95 OF THE WH COMMITTEE

Recalling the Manama DECISION 42COM 7B.95 of the World Heritage Committee, Uganda noted that most of the issues had not been well explained in earlier reports and this led to a number of items being highlighted as issues against Rwenzori Mountains National Park. The following subsections provide feedback and give an account of the situation as it is on the ground at the property.

a) Conduction of Coordinated patrols with Virunga National Park Staff

The trans-boundary initiatives are still ongoing focusing on field meetings and coordinated patrols. Quarterly meetings are being held between Uganda and DR Congo to plan operations and discuss conservation issues at the common border. Insecurity caused by insurgents across in Democratic Republic of Congo (DRC) is a limiting factor to the extent of patrols coverage by the DRC Rangers. 8 coordinated boundary patrols were done along the DRCs Virunga National Park. Most areas of the Protected Area (PA) along the porous border with DRC were patrolled, the patrols covered areas of Mihunga, Langoma, Bukurungu, Kinyamiyeye, Lamia Congo border, Kalindera, Kakubunguka, Mukasimon, Malindi to Kakuka the north western spar of the Park. The general patrol situation is demonstrated later on the map under section 3(c) on the implementation of

the General Management Plan.

b) Operation of Kilembe Copper Mines

No mining activities are recorded inside the Park. Kilembe mines closed in the 1970s and since then no mining activities have been done. It should also ne noted that the mines were adits underground and not on the surface of the then Forest Reserve before the Park was gazetted and inscribed on the World Heritage List. The recently cancelled license for Tibet Hima had not commenced any activities in the area that hosts the property. To confirm or rule out the fears of the advisory bodies and hence WH Committee on the impact of the old mines to the environment, water quality tests were done recently (March/ April 2019) as a way of assessing the possibility of contaminants being discharged into the environment. This assessment was done jointly between Uganda Wildlife Authority (UWA) and the Ministry of Water and Environment on Rivers Mubuku, Nyamwamba, Lamia, Rwiimi and Sebwe **(Figure 1, Table 1 and annex I).** Whereas Nyamwamba was expected to be directly affected by the old mines, samples from other rivers remained the control for purposes of comparison of the five water sources. The parameters investigated included conductivity, water velocity, Water temperature, mineral and salt composition and amount of dissolved oxygen in the water. Annex I are water certificates for Mubuku and Nyamwamba Rivers.

From the above tests, it is generally clear that there are no significant differences in the parameters of all the five major rivers flowing out of RMNP. Focusing on Mubuku and Nyamwamba (Annex i), both rivers have a low mineral composition, implying that there is no mineral contamination for the sites located inside and outside the Property. It is also clear that the water from the old mine tunnels at Kilembe does not impact on the mineral composition of water within River Naymwamba. This therefore confirms the fact that flow coming out of the defunct mines has no impacts on the environment. However, the turbidity of water at the Park was low as opposed to outside the park. This implies that Mubuku and Nyamwamba waters have fewer particles before it flows out of the park where it is affected by agricultural activities. We shall continue to implement the restoration of water catchment and river banks management program to enhance water quality.

c) The General Management Plan

The UWA Board of Trustees approved the General Management Plan (GMP) 2016 – 2026 for implementation. This section is comprised of some updates on activities towards implementation of this GMP as outlined below:

Figure: 1

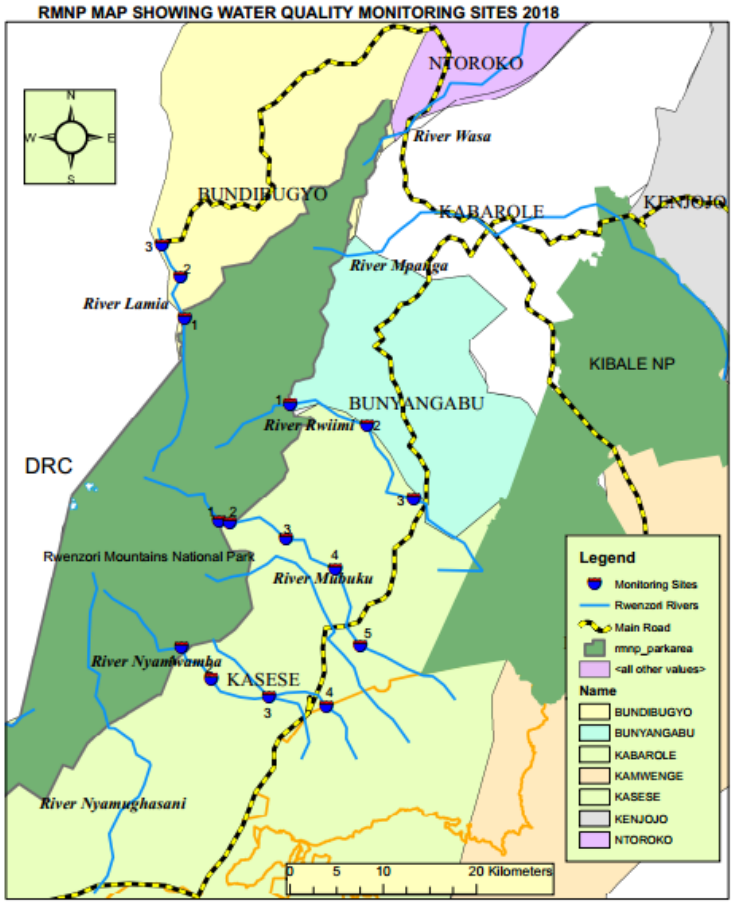


Table 1: **Water Quality Assessment data April/ 2019**

Site	Temperature (^{0}C)	Potential of Hydrogen (PH)	Oxidation-reduction potential (ORP)	Dissolved oxygen (D02)	Electrical Conductivity (EC)	Turbidity (NTU)	Total Dissolved Solids (TDS) (ppm)
Nyamwamba 1	20.45	8.65	252	4.5	280	0.6	180
Nyamwamba 2	21.75	8.47	298	6	340	0.4	220
Lamia 1	17.56	7.92	257	3	660	0.1	490
Lamia 2	22.76	8.02	314	0.06	630	2.9	410
Mubuku 1	18.13	2.36	229	0.6	480	0.1	310
Mubuku 2	20.73	8.11	295	0.8	350	0.1	280
Rwiimi 1	23.94	7.47	323	0.06	750	5.93	490
Rwiimi 2	20.18	8.18	235	6.9	820	3.4	220

i. ***Community engagement and involvement in Conservation of the Site***

Rwenzori mountains National Park World Heritage Site is a fragile ecosystem of Global interest - ecologically, economically and culturally. It is an important source of resources for local communities and the globe at large. The communities, who live on the slopes of the Mountain, derive their livelihood from the park for resources like medicinal plants, mushrooms, water, firewood, honey, fibers, Dry bamboo stems and bamboo sheath. 6 multiple resource access memoranda of understanding MoU's were reviewed and signed to enhance sustainable resource access. This approach helped to bring communities on board to participate in conservation of park resources as they appreciate the benefits (Table 2) got from RMNP.

Table 2: Resource Use - Bamboo Harvest						
Years	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Mabere	108	112	177	315	421	399
Nsura	45	48	38	567	632	567
Kikyo	0	22	21	238	722	811
Kazingo	7	45	45	397	354	277
Kamabale	31	20	18	302	219	288
Busamba	0	14	18	231	373	199
Total	**191**	**261**	**317**	**2050**	**2721**	**2541**
Monitory Value	**955,000**	**1,305,000**	**1,585,000**	**10,250,000**	**13,605,000**	**12,705,000**

Site Management continued to engage, promote and involve the local community in other conservation areas and Tourism activities (*Rwenzori mountaineering services, Ruboni community, Katebwa community chimpanzee habituation association, Nyamughasani community tourism association, Rwenzori Guides and escorting association and Turaco Tourism community group*) around the site. Ant-poaching community associations (under Rwenzori Anti-Poaching Association - RAPA) have been supported to sensitize the communities against poaching and implement livelihood schemes in Kasese, Bundibugyo and Bunyangabu Districts. 23 groups who denounced and handed over their poaching devices were supported with various livelihood projects worth 71,000,000 UGX (US $19,722). The communities continued to manage the entire Park boundary through the community boundary management committees under Memoranda of Understanding (MOU). This way, the boundary has been made clear to the surrounding communities to avoid encroachments and strengthen Park integrity. The communities have also been engaged in the conservation of the chimp through

community conservation awareness. Other engagements are in the areas of beekeeping, and Garlic growing to enhance income generation for livelihood improvement.

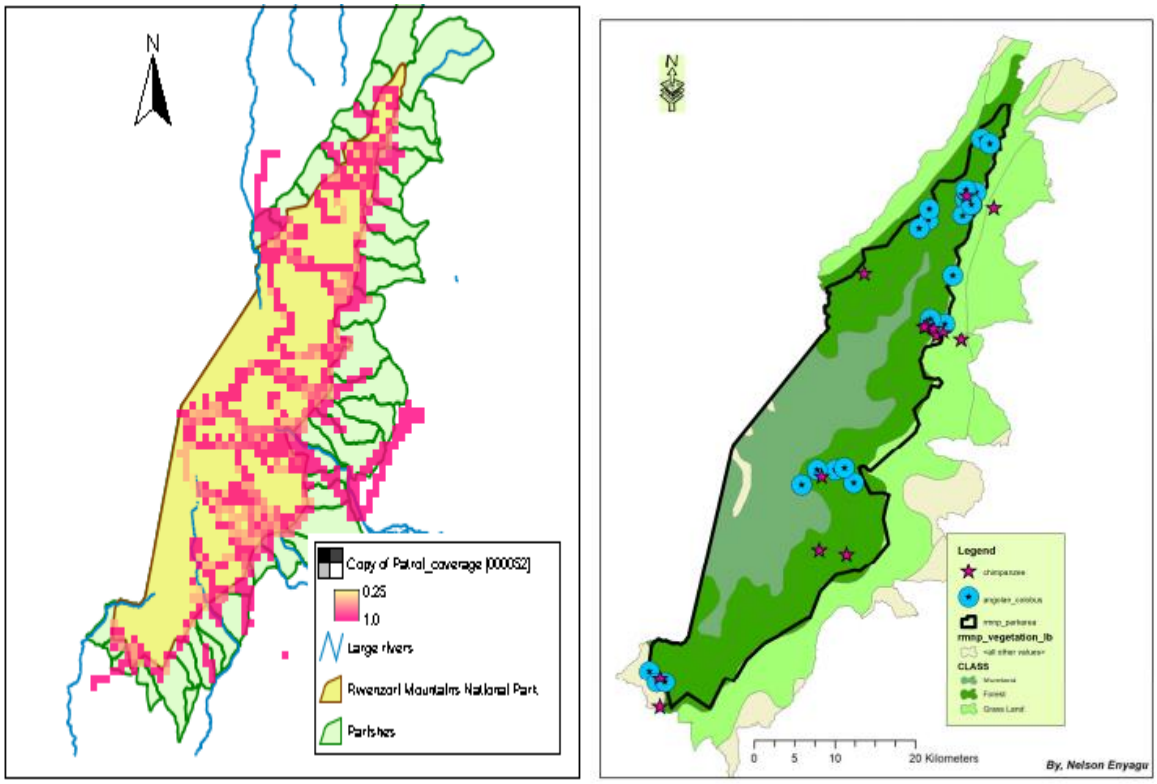
ii. Patrols

During the reporting period, routine patrols were conducted to protect the site resources against external human pressures. Total number of patrols carried out during the financial year 2018/2019 was **311** covering a distance of **2887.5km** compared to 214 patrols done in **2017/2018** covering **1726.3km** of distance. This showed an increase in patrol effort by **31%** as illustrated in **Table 3 and Figure 2** below. A number of wildlife were sighted including those captured under **Figure 3.**

Table 3: 2018/2019 Patrol Effort DATA

Period	No of Patrols	No of Days (All)	No of Nights (All)	Distance (km)
Jul-18	31	88	57	310.7
Aug-18	20	67	47	234.5
Sep-18	30	68	38	166.4
Oct-18	21	41	20	72.6
Nov-18	47	122	75	483.4
Dec-18	31	80	49	349.9
Jan-19	25	56	31	250.3
Feb-19	22	54	32	329.9
Mar-19	23	66	43	163.0
Apr-19	25	45	20	143.3
May-19	17	44	27	209.8
Jun-19	19	39	20	173.4
Total	**311**	**770**	**459**	**2887.5**

Figure 2: Patrol coverage map 2018/2019 **Figure 3: Key animal Sightings 2018/2019**



iii. Climate Change Mitigation

Uganda Wildlife Authority (UWA) in collaboration with WWF Uganda Country Office (WWF UCO) implemented the S*ustainable financing of the Rwenzori Mountains National Park (SFRMNP)* Project. The main aim of the project was to achieve effective financing for the conservation of the Rwenzori Mountains through engaging the private sector in a **Payment for Water Services (PWS)** scheme that realizes the potential value of the RMNP. The project was implemented in partnership with the National Environment Management Authority (NEMA) with funding from the European Union (EU) and the French Facility for Global Environment (FFEM). The project scope is covering the Mubuku - Nyaamwamba water catchment in Kasese District.

Following this initiative, activities aiming at mitigating the impact of climate change in Rwenzori were initiated **(Table 4 and Figure 4).** The program brought on Board the water users to support the conservation of water catchment areas. The program was piloted and now being implemented in Nyamwamba and Mubuku water catchment areas. The scheme was piloted in the service areas equivalent to 4,980.4 ha selected out of 32,456 ha located within the degradation hotspots upstream where Sustainable Land Management (SLM) interventions (categorized as Terracing, Mulching and Agroforestry measures) are needed to deliver the services downstream. A total of six (7) service buyer (Hydropower – four, mining - two & water utility - one) companies have been identified

Table 4: Climate mitigation and soil conservation interventions

Interventions	Areas	Total plots	unit measure	Total targets	Achieved	%
Grass / Bamboo for river banks protection	R.nyamwamba, Mubuku, Sebwe	32	meters	2079	1419	68.25
Trees and shrubs for stream bank protection	R.nyamwamba, Mubuku, Sebwe	50	seedlings	4607	3011	65.36
Tree planting on boundaries	Butama, Ndugutu, Bupomboli, Kisamba and Bunyandiko	74	seedlings	50000	36239	72.48
Tree planting in compounds, gardens and public places	Kasese, Bunyangabu and bundibugyo districts	24	seedlings	12386	7243	58.48
Grass for stabilization of soil and water conservation structures	Kasese,	22	meters	1620	627	38.70
Trees and shrubs for stabilization of soil and water conservation structures	Kasese	17	meters	670	540	80.60
Establishment of Trees and shrubs in contour hedge rows	Kasese	12	meters	4210	1567	37.22
Woodlot establishment	Ntoroko, Bunyangabu, Kasese	6	acres	50	17.2	34.40
Woodlot establishment	Ntoroko, Bunyangabu, Kasese	14	seedlings	25000	16,163	64.65
Tree planting on roads and paths	Kasese	13	seedlings	8295	6239	75.21
Tree planting for wind breaks and shelter belts	Kasese, Bunyangabu and Bundibugyo Districts	9	seedlings	1278	1348	105.48
Protection of existing forests and trees on the farm	Mihunga	2	acres	2.5	2.5	100.00

Figure 4: River banks protection intervention along Mubuku River

for the PWS scheme and have supported farmers upstream. The Mubuku-Nyamwamba Water Users Association, a community-based group, was formed to implement the PES project in the Mubuku – Nyamwamba water catchment area with support from WWF.

In addition, under the climate change mitigation, communities have been encouraged to plant tree woodlots along the slopes of the Rwenzoris with over 16,000 woodlots in all the districts bordering the park. Furthermore, the entire boundary of RMNP has been planted with live markers to mitigate encroachment and cutting down of park trees. About 2km of live boundary markers were planted with support from Sindila-Ndugutu HEP

iv. Mitigation of crop raiding

To enhance conservation of the primates (chimps, baboons and monkeys), communities have been mobilized to identify hot-spot areas of incidences of crop raiding which are being planted with the Mauritius thorn to mitigate and minimize crop raiding.

A pilot program of promoting alternative high value crop, onion and garlic growing in the frontline parishes was initiated within Katebwa-Kinyampanika parishes. The crops are non-palatable to the primate community and are highly valued to the livelihood of the people.

v. Ecological Monitoring

a. **Ecological monitoring plan**

A detailed ecological monitoring plan was developed for Rwenzori in 2010 through a consultative and Participatory approach with UWA staff and key stakeholders.

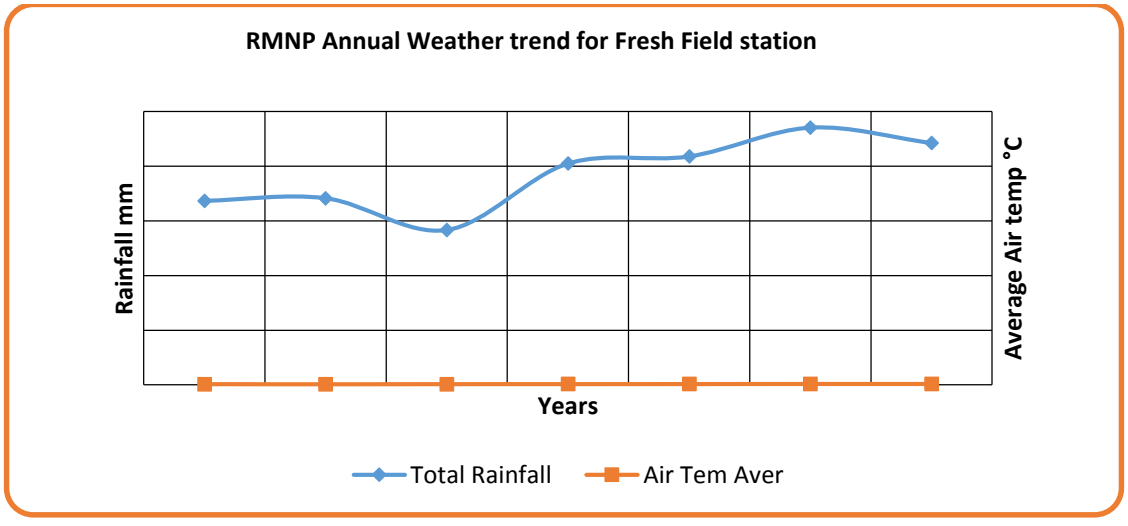
The monitoring program is currently focusing on the key issues identified in the plan.

b. **Monitoring impact of climate change;**
On climate change, management of the site continues to carry climate change monitoring activities that are aimed at impacts assessment and mitigation as has already been mentioned and will be read later hereafter.

c. **Water Quality Monitoring**
RMNP's noble conservation value is its role as a water catchment site. A number of glacial lakes exists in the alpine zone, and a multiple of rivers originate from the mountain to feed important life supporting activities (agriculture irrigation, domestic use, mini-hydro power generation, and industrial use) in the plains occupied by millions of people, industries and national parks. The Mountains are a key source of water that contribute to the Nile river as it flows to Sudan and Egypt. Because of this value, the water quality that comes out of the Rwenzori is monitored using bio-monitoring approach. Bio-monitoring activities are conducted on the five main rivers of Mubuku, Nyamwamba, Lamia, Rwiimi and Sebwe (Table 1 and Annex I).

d. **Weather Monitoring**
During the reporting period, the data collected provided useful information on possible causes of snow recession and related glaciers melting. A rising trend in temperatures is being noticed in the mountain at the Fresh Field Pass as shown in Figure 5 below.

Figure 5:



Snow Recession monitoring continued from the three permanent sample plots established on Mt Stanley, Speke and Margarita peak. The findings indicate an annual reduction of **2 acres** of Glacier with a loss of volume of about **0.6m^3** during the reporting period of 2018 – 2019. The melting of glaciers has also resulted into crevasses which are a threat to tourism and infrastructure. Mitigation of climate change continues through tree planting outside the property, construction of elevated infrastructure to ensure that they are not swept away by floods. Site management will be glad learning from other sites on how this challenge (climate change mitigation) could be handled.

e. **vegetation monitoring**

During the reporting period, vegetation monitoring was done in the bamboo and forest. Noted that there are no significant changes in the vegetation zones. Site management will continue to monitor the site for any vegetation changes resulting from global warming.

f. **Wildlife Monitoring**

Site management continued to monitor animal distribution within the site using Ranger based data collection approaches during the day to day patrols. Specific monitoring programs for Elephants and chimpanzees were also done in the specific areas of Katebwa, Kyoho and Kyalhumba. The results indicate that most of the animals are found in the forest zone, specifically the primates - Chimps and monkeys. 5 Elephants were observed around mahoma ridge, Rwenzori Duikers and Rock hyrax were encountered in the alpine zone. Elephant distribution was also seen to be limited to the forest zone and localized to the central zone of the Park, between Lake Mahoma, Nyabitaba tourist camp and River Mubuku down to the Park boundary in Mihunga. Figures 6 - 8 below are photos for some of the rare sightings made during the year. Resources have been committed in the 2019/2020 to conduct the census for the Chimpanzee and elephants – the procurement process has been commenced and hopefully a contractor will be identified within the October – December 2019 quarter.

vi. ***Fire management***

Fire is identified as a potential threat to the park natural ecosystems. The Rwenzori GMP recognizes the fact that wild fires are relatively few within RMNP because of the ever green vegetation. However, due to climate change conditions, fire incidences started increasing and the cause of these fires being poaching, honey collection, poor agriculture methods by communities adjacent

Figure 6: Rwenzori Duiker **Figure 7: Rock Hyrax**

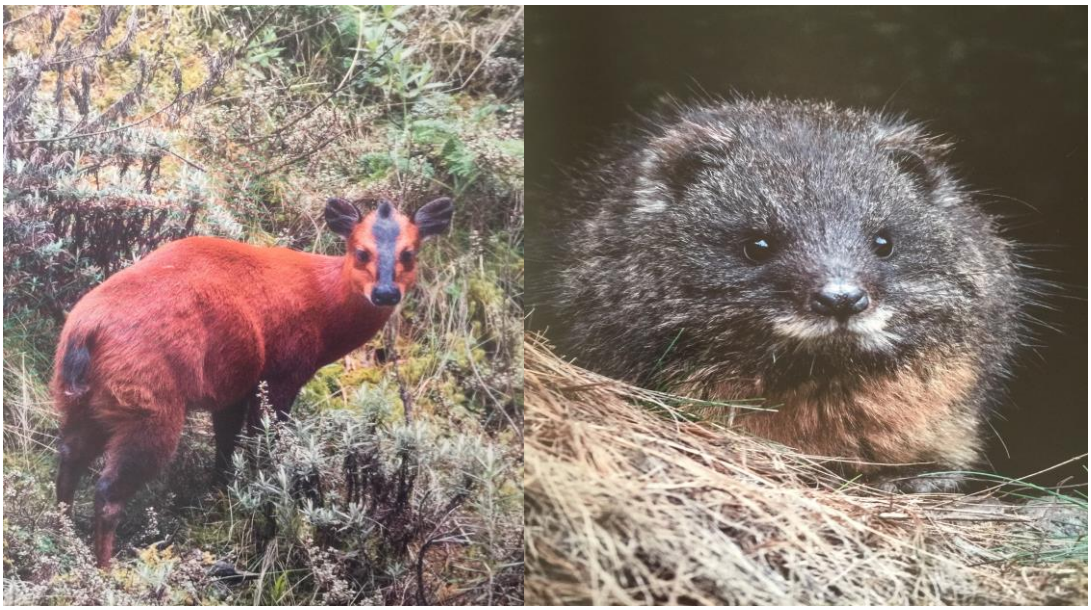


Figure 8 (BELOW): Elephant in areas of Kyoho along the Central Tourist route

to the Park. These fires cause damage to the forest, properties and leave negative impacts on the fragile mountain ecosystem hence calling for urgent need to prevent them. In order to ensure that these illegal fires are controlled, a fire management plan was developed and is being implemented. The fire management plan is aimed at providing guidance to RMNP site management on combating dangerous and destructive fires during the dry seasons to reduce their potential impacts to the site. The fire management plan was prepared in a consultative, interactive and participatory manner, involving various stake holders within and around Rwenzori region.

With guidance from the Fire Management Plan, site management applied various strategies to control and fight fires in and outside the protected area to minimize negative impacts. Strategies implemented included training of RMNP staff and community groups in

firefighting techniques, opening and maintaining of park boundary to stop fire spread from community land to the site **(Figure 9)**, Media sensitization and meetings.

Figure 9: Community Engagement members in boundary maintenance to create a fire line

Early warning massages are being run on local FM Radios located within the adjacent districts of Kasese, Kamwenge, Fort-portal and Bundibugyo. The massages are aimed at sensitizing the communities, local authorities and leaders to ensure proper management of fires near RMNP. Community sensitization meetings are conducted in the Park adjacent villages to prepare communities to control and report any fire that may occur in their area of jurisdiction. Fire-fighting crews were created from the community villages bordering the Park and these were helpful in extinguishing fire in the gardens before it causes damage to the World Heritage property. The frontline mobilized community (boundary management committees and Resources use committee) and equally cultural Institutions have been instrumental in fire awareness campaigns. 10km Fire lines were opened in the fire prone areas to help control community fires from crossing into the Park from the community gardens.

Meanwhile, monitoring of the regeneration process in the earlier reported burnt areas within the Nyamwamba valley was done. The areas that were affected by fire inside the Park are recovering steadily with sighting of wild game especially the Rwenzori duikers. Field observations show a rapid regeneration of grass, Alchamellan shrubs, in most of the burnt areas.

vii. Infrastructure and development issues on site

To improve on Visitor enjoyment, experience and satisfaction, tourism infrastructure improvements have been done at the various places along the tourism trails. 5 Eco-san toilets were constructed at lower Bigo within the central circuit (1), Bukurungu trail (3) and Katebwa chimpanzee trail (1) - **Figure 10**. Margherita monument was constructed at Margherita Peak.

A new trail (Katebwa Chimpanzee Trail) was established and opened for tourism starting from Bunyangabu district in the areas of Katebwa. This was done with support from WWF under sustainable financing for the Rwenzori.

In order to minimize impacts of tourism activities to high altitude bogs and their wildlife, more board walks were constructed with support from ministry of Tourism Wildlife and Antiquity. 482m of board walk was constructed at Bigata 1, Mukongotsa and Kachope along Kilembe trail and 1 bridge was constructed at yeriya along bukurungu trail – **Figures 11 and 12** below.

Figure 10: Eco-san Toilet and Resting Shelter

Figure 11: Boardwalk Figure

12: Bridge along Bukurungu Trail

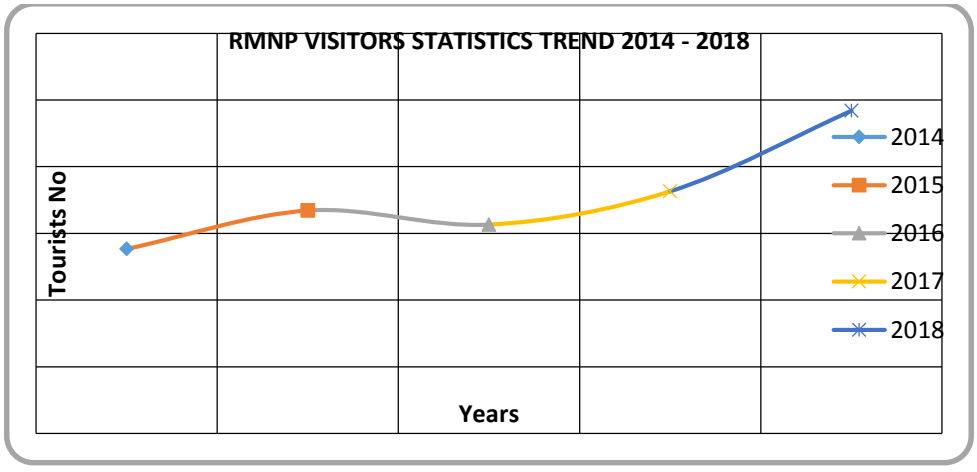
viii. ***Tourism* activities:**

During the reporting period of Jan – Dec 2018, the Site received a cumulative total of **4,839** tourists **(Table 5 and Figure 13),** the number is increasing. However, tourist numbers are still lower than those of other similar sites in region such as Mt. Kilimanjaro. This is because Rwenzori is more difficult to climb than other mountains in the region. The climbing requires strong, young and energetic people as trekkers. Site management is nevertheless being supported by the State to access funding for management of the property. With the marketing strategy in place, the site is being marketed to ensure financial sustainability through tourism.

Table 5: Visitor statistics 2014 – 2018

Month	2014	2015	2016	2017	2018
Jan	188	226	206	185	319
Feb	158	179	142	193	203
Mar	220	243	109	128	108
Apr	709	613	108	226	636
May	43	54	49	168	541
Jun	271	433	125	187	193
Jul	193	324	456	542	542
Aug	455	454	493	807	807
Sept	140	127	943	566	564
Oct	114	142	223	146	100
Nov	117	411	97	128	241
Dec	159	137	181	356	585
Total	**2,767**	**3,343**	**3,132**	**3,632**	**4,839**

Figure 13:



With the marketing efforts being put in place, there is a notable improving tourist trend of 24% between 2017 and 2018. Mitigation measures have been put in place to ensure that tourism does not destroy the fragile ecosystem in the park. Such measures include the construction of board walks above the ground to save the tussocks within the wetlands, construction of eco-friendly toilets, and regulation of tourists trekking the Mountains in a day.

d) Conduction of the Chimpanzee Census

As advised by the 42nd WHC, Uganda under took the necessary steps to commit resources within the 2019/2020 financial year to undertake a comprehensive chimpanzee census for Rwenzori. The procurement process has commenced and we hope to have a consultant on board by end of November and field activities commenced within December 2019. Results of this activity will be shared with the WHC when the final analysis is done.

e) The Cable Car Project

The cable car project has not yet been implemented. The project, if implemented, will be commenced with feasibility and an environmental impact assessment studies which will be shared and reviewed by all stakeholders before they approved for implementation. The feasibility study requires close to US $1million dollars which is yet to be found. The feasibility study will outline the economic benefits to the site vis-à-vis the site values and inform management on viability of the project and whether it would be necessary to go ahead with the EIA studies. A pre-feasibility exercise was done and a report will be submitted to the WHC along this report.

f) Monitoring of Sindila and Nyamwamba Hydro-power facilities Operations

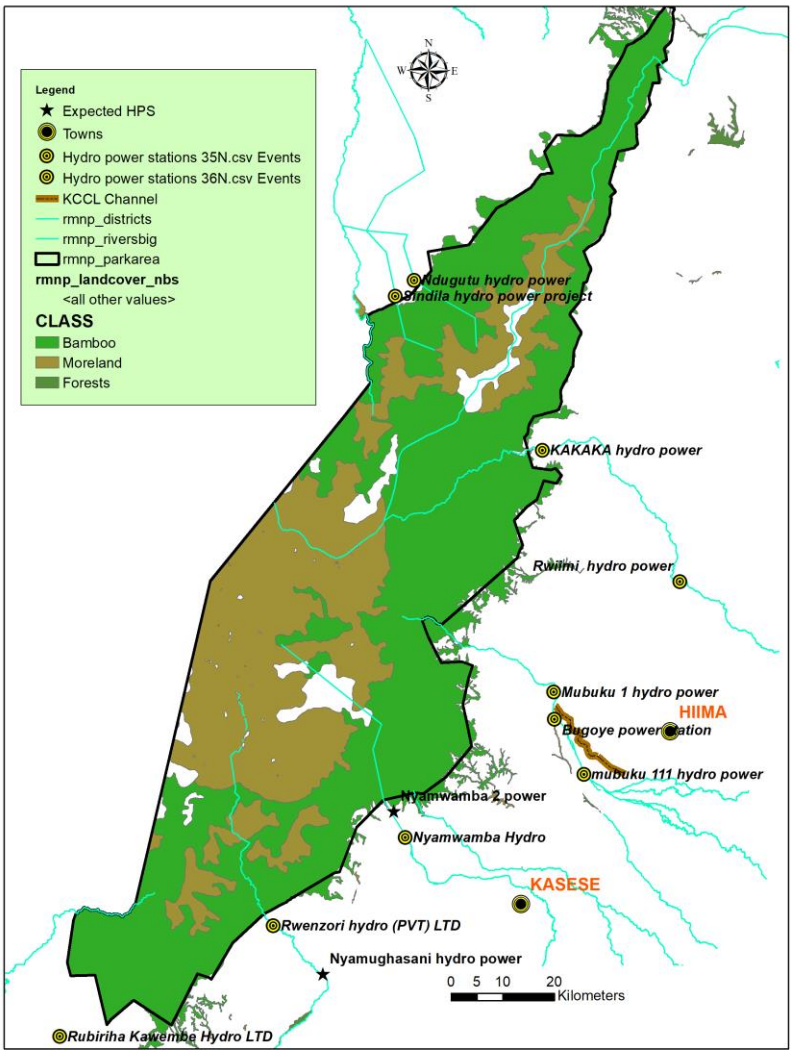
Monitoring the implementation of mitigation measures identified in the EIAs is being done at all the hydro power sites to ensure that the likely negative impacts of hydropower to the property ecosystem are contained. In the neighborhood of Ndugutu, Sindila and Nyamwamba in Kilembe, ranger outposts have been established to ensure presence of site staff for patrol purposes and daily monitoring of HEP activities. **Table 6 and Figure 15** show the location of the HEP weirs, surge tanks and power houses outside the park boundary. It should be noted that none of the HEP projects are located within the boundaries of the property. The WH property is located above the HEP project sites and no influent flowing out of the HEP facilities goes into Park. Generally, no impacts arising from the operations of the HEP facilities have been noticed or experienced within the boundaries of the World Heritage Property.

Table 6: Location of Sindila, Ndugutu & Nyamwamba HEP stations around RMNP

SNO	Name of the projects	Observation	Easting's	Nothings	Altitude
1	Sindila hydro power project	Weir	833466	64073	1142
	Sindila hydro power project	Power house	832199	66636	1143
2	Ndugutu hydro power project	Weir	166921	65249	1144
	Ndugutu hydro power project	Power house	833274	66648	1147
3	Nyamwamba Hydro power	Weir	166271	4196	1456
	Nyamwamba Hydro power	Surge Tank	166366	24160	1453
	Nyamwamba Hydro power	Power house	167819	21702	1275

Figure 14:

RMNP MAP SHOWING LOCATION OF HYDRO POWER STATIONS



g) Elephant Census

Elephant Census commenced with the sampling of elephant dung which is being analyzed for DNA. More resources have been committed in the 2019/2020 financial year to complete this exercise.

4. OTHER CONSERVATION ISSUES THAT MAY IMPACT THE SITE OUTSTANDING UNIVERSAL VALUES

i. **Financial sustainability** – Lack of resources may impact negatively on the maintenance of the Outstanding Universal values. Currently, the property generates its own revenues that cover all the operating costs. Additional support has continued to flow in from UWA Head Office and the Treasury to cover capital developments. For now, site management has adequate resources to implement the GMP. Nevertheless, Uganda is focusing on ensuring that the property is in position to cover its entire budget including the capital investments. To achieve this, we have commenced programs that we hope will soon yield fruit. These include the payment for ecosystem services, aggressive marketing of the site and improving the infrastructure to enhance visitor satisfaction.

ii. **Wild fires** – A Fire Management Plan was drawn and is being implemented. The implementation is participatory with communities as key stakeholders. The measures being taken are already mentioned under section 3 above.

iii. **Increasing Human Population** – The property is surrounded by a buffer area with increasing human population that may put pressure on the park resources. Management has already clearly marked the park boundaries to eliminate possible encroachment of the park. Patrol efforts have been stepped up with patrol posts well distributed along the property boundary to ensure that continuous monitoring of the site is achieved on a daily basis. Site management has also engaged the community in various awareness and restoration activities including soil conservation, tree planting and river banks management. We also have a fully-fledged community conservation unit that interfaces with the communities in ensuring good relations between Site Management and the community. We have further commenced livelihood enhancement projects that are anticipated to divert community pressure from the park. A number of projects are now being funded by UWA at household/ community level for this purpose and more funds have been committed within the 2019/2020 financial year to continue with these efforts. Site management has engaged the community through negotiating multiple resources access agreements that regulate resource access as a means of avoiding over exploitation of the non-timber resources. Woodlots are also being encouraged and some of the community members have started implementing this intervention. Meanwhile, family planning strategies are being enforced by the Ministry of Health

to ensure birth control.

iv. **Climate change effects** – Noticeable snow recession has been reported on the Rwenzoris as a result of global warming and this may, in the long run, affect the water catchment value of RMNP. Climate change has also affected the rain regimes with rains sometimes received as heavy downpours leading to flooding and destruction of infrastructure and river banks. To mitigate this, site management has embarked on redesigning and construction of raised infrastructure (like bridges and boardwalk platforms) to provide for free water flow under the walk ways to minimize the impact of floods on the tourism infrastructure. As reported earlier, we have embarked on restoration programs of the landscapes outside the park and river banks to ensure controlled soil erosion and protection of river banks from excessive degradation.

5. INFORMATION IN COMFORMITY WITH PARAGRAPH 172 OF THE OPERATIONAL GUIDELINES TO THE UNESCO CONVENTION

This section is intended to cover information related to potential major restoration programs, new major constructions within the boundaries or buffer areas where such developments may affect the Outstanding universal values of the Property, its authenticity and integrity.

Uganda has no intentions to neither change the boundaries of the property nor develop major infrastructure related to site management that may negatively impact the property's Outstanding Universal values, its authenticity and integrity. The boundaries have been entirely marked and Uganda continues to uphold protection of the site as a World Heritage Site.

6. CONCLUSION

Uganda has done everything possible to maintain and protect the Outstanding Universal values of the property. The water catchment values and integrity of the site are being adequately protected despite the effects of global warming that cannot be fully addressed locally at site level. Mitigation of a number of activities that have a likelihood of impacting the site have already been outlined. The community relations are good and management issues are adequately being handled. In general terms, the site values, integrity and site protection are all being addressed.

Annex 1: Water quality monitoring Certificates for Mubuku and Nyamwamba Rivers

Republic of Uganda

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Certificate of Analysis

NAME OF CLIENT	UGANDA WILD LIFE AUTHORITY	SOURCE NAME & TYPE	R-Mubuku Downstream (UTM36N177305E 33710N)	DATE SAMPLED	14/03/2019
ADDRESS OF CLIENT	KASESE	SOURCE LOCATION	Kasese	DATE RECEIVED	16/03/2019
LABORATORY NO	E37020	SAMPLED BY	CLIENT	ANALYSIS COMPLETION DATE	26/03/2019

METHOD CODE	PARAMETER	TEST RESULTS	National Drinking Water Standards	METHOD CODE	PARAMETER	TEST RESULTS	National Drinking water Standards
1020	pH (pH Units)	6.9	6.0 - 8.5	1220	Total Phosphorus-P(mg/l)	0.06	2.2
1030	Electrical Conductivity (µS/cm)	78	1000	1240	Biochemical Oxygen Demand (mg/l)	19	
1041	Total Dissolved Solids (mg/l)	55	1200	1250	Chemical Oxygen Demand (mg/l)	22	
1050	Suspended Solids at 105Degrees Centigrade (mg/l)	8	5	1260	Flourides (mg/l)	0.1300	1.5
1060	Turbidity (NTU)	1.4	5	ICP-OES	Chromium (Cr)(mg/l)	0.0052	0.050
1070	Total Alkalinity (mg/l) as Calcium Carbonate	24		ICP-OES	Lead (Pb)(mg/l)	<0.0002	0.010
1070	Bicarbonates (mg/l)	29		ICP-OES	Arsenic (As)(mg/l)	0.0008	0.010
1080	Total Hardness (mg/l) as Calcium Carbonate	37	300	ICP-OES	Copper (Cu)(mg/l)	0.1200	1.000
1080	Calcium (mg/l)	27	150	ICP-OES	Zinc (Zn)(mg/l)	0.0070	5.000
1080	Magnesium (mg/l)	3.40	150	ICP-OES	Cobalt (Co)(mg/l)	0.0546	0.500
1090	Sodium (mg/l)	30		ICP-OES	Nickel (Ni)(mg/l)	<0.0005	0.500
1100	Potassium (mg/l)	1.4		ICP-OES	Manganese (Mn)(mg/l)	0.0540	0.100
1110	Reactive Phosphorus-P (mg/l)	0.024	10	ICP-OES	Selenium (Se) (mg/l)	<0.002	0.500
1140	Chloride (mg/l)	1	250	ICP-OES	Beryllium	0.0075	
1150	Sulphates (mg/l)	22	400	ICP-OES	Iron(Fe) (mg/l)	0.0218	1.500
1170	Ammonia-N (mg/l)	0.007	0.5	ICP-OES	Molybdenum (Mo)(mg/l)	0.0016	
1180	Nitrates-N(mg/l)	0.271	10	ICP-OES	Aluminium (Al)(mg/l)	0.0268	0.500
1190	Nitrites-N (mg/l)	<0.002	0.9	ICP-OES	Mercury (Hg)(mg/l)	<0.0001	0.001
1200	Total Nitrogen-N (mg/l)	0.41	10	ICP-OES	Cadmium (Cd)(mg/l)	0.0072	0.003

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NAME OF CLIENT	UGANDA WILD LIFE AUTHORITY	SOURCE NAME & TYPE	River Mubuku upstream (UTM 36N 168770E 39633N	DATE SAMPLED	14/03/2019
ADDRESS OF CLIENT	KASESE	SOURCE LOCATION	Kilembe, Kasese	DATE RECEIVED	16/03/2019
LABORATORY NO	E37021	SAMPLED BY	CLIENT	ANALYSIS COMPLETION DATE	26/03/2019

METHOD CODE	PARAMETER	TEST RESULTS	National Drinking Water Standards	METHOD CODE	PARAMETER	TEST RESULTS	National Drinking water Standards
1020	pH (pH Units)	7.1	6.0 - 8.5	1220	Total Phosphorus (mg/l)	0.15	2.2
1030	Electrical Conductivity (µS/cm)	75	1000	1240	Biochemical Oxygen Demand (mg/l)	11	
1041	Total Dissolved Solids (mg/l)	53	1200	1250	Chemical Oxygen Demand (mg/l)	24	
1050	Suspended Solids at 105Degrees Centigrade (mg/l)	6	5	1260	Flouride (mg/l)	0.1400	1.5
1060	Turbidity (NTU)	0.5	5	ICP-OES	Chromium (Cr)(mg/l)	0.0046	0.050
1070	Total Alkalinity (mg/l) as Calcium Carbonate	24		ICP-OES	Lead (Pb)(mg/l)	<0.0002	0.010
1070	Bicarbonates (mg/l)	29		ICP-OES	Arsenic (As)(mg/l)	<0.001	0.010
1080	Total Hardness (mg/l) as Calcium Carbonate	33	300	ICP-OES	Copper (Cu)(mg/l)	0.0087	1.000
1080	Calcium (mg/l)	24	150	ICP-OES	Zinc (Zn)(mg/l)	<0.0002	5.000
1080	Magnesium (mg/l)	3.80	150	ICP-OES	Cobalt (Co)(mg/l)	0.0068	0.500
1090	Sodium (mg/l)	32		ICP-OES	Nickel (Ni)(mg/l)	<0.0005	0.500
1100	Potassium (mg/l)	1.1		ICP-OES	Manganese (Mn)(mg/l)	0.0049	0.100
1110	Reactive Phosphorus-P (mg/l)	0.025	10	ICP-OES	Selenium (Se) (mg/l)	<0.002	0.500
1140	Chloride (mg/l)	1.2	250	ICP-OES	Beryllium	0.0073	
1150	Sulphates (mg/l)	10	400	ICP-OES	Iron(Fe) (mg/l)	0.0181	1.500
1170	Ammonia-N (mg/l)	0.042	0.5	ICP-OES	Molybdenum (Mo)(mg/l)	0.0018	
1180	Nitrates_N (mg/l)	0.4	10	ICP-OES	Aluminium (Al)(mg/l)	0.0077	0.500
1190	Nitrites-N (mg/l)	<0.002	0.9	ICP-OES	Mercury (Hg)(mg/l)	<0.0001	0.001
1200	Total Nitrogen-N (mg/l)	0.5	10	ICP-OES	Cadmium (Cd)(mg/l)	0.0075	0.003

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NAME OF CLIENT	UGANDA WILD LIFE AUTHORITY	SOURCE NAME & TYPE	R-Nyamwamba Downstream (UTM36N168420E 205	DATE SAMPLED	14/03/2019
ADDRESS OF CLIENT	KASESE	SOURCE LOCATION	Kilembe, Kasese	DATE RECEIVED	16/03/2019
LABORATORY NO	E37019	SAMPLED BY	CLIENT	ANALYSIS COMPLETION DATE	26/03/2019

METHOD CODE	PARAMETER	TEST RESULTS	National Drinking Water Standards	METHOD CODE	PARAMETER	TEST RESULTS	National Drinking water Standards
1020	pH (pH Units)	6.7	6.0 - 8.5	1220	Total Phosphorus-P (mg/l)	0.2	2.2
1030	Electrical Conductivity (µS/cm)	98	1000	1240	Biochemical Oxygen Demand (mg/l)	16	
1041	Total Dissolved Solids (mg/l)	69	1200	1250	Chemical Oxygen Demand (mg/l)	26	
1050	Suspended Solids at 105Degrees Centigrade (mg/l)	2	5	1260	Flourides (mg/l)	0.08	1.5
1060	Turbidity (NTU)	1.2	5	ICP-OES	Chromium (Cr)(mg/l)	0.0049	0.050
1070	Total Alkalinity (mg/l) as Calcium Carbonate	15		ICP-OES	Lead (Pb)(mg/l)	<0.0002	0.010
1070	Bicarbonates (mg/l)	18		ICP-OES	Arsenic (As)(mg/l)	0.0017	0.010
1080	Total Hardness (mg/l) as Calcium Carbonate	23	300	ICP-OES	Copper (Cu)(mg/l)	0.0091	1.000
1080	Calcium (mg/l)	8.6	150	ICP-OES	Zinc (Zn)(mg/l)	<0.0002	5.000
1080	Magnesium (mg/l)	1.02	150	ICP-OES	Cobalt (Co)(mg/l)	0.0069	0.500
1090	Sodium (mg/l)	1.7		ICP-OES	Nickel (Ni)(mg/l)	<0.0005	0.500
1100	Potassium (mg/l)	0.7		ICP-OES	Manganese (Mn)(mg/l)	0.0050	0.100
1110	Reactive Phosphorus-P (mg/l)	0.06	10	ICP-OES	Selenium (Se) (mg/l)	<0.002	0.500
1140	Chloride (mg/l)	1	250	ICP-OES	Beryllium	0.0077	
1150	Sulphates (mg/l)	0.1	400	ICP-OES	Iron(Fe) (mg/l)	0.0280	1.500
1170	Ammonia-N (mg/l)	0.06	0.5	ICP-OES	Molybdenum (Mo)(mg/l)	0.0003	
1180	Nitrates-N (mg/l)	0.3	10	ICP-OES	Aluminium (Al)(mg/l)	0.0260	0.500
1190	Nitrites-N (mg/l)	<0.002	0.9	ICP-OES	Mercury (Hg)(mg/l)	<0.0001	0.001
1200	Total Nitrogen (mg/l)	0.45	10	ICP-OES	Cadmium (Cd)(mg/l)	0.0071	0.003

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NAME OF CLIENT	UGANDA WILD LIFE AUTHORITY	SOURCE NAME & TYPE	R-Nyamwamba Upstream (UTM36N33730E 20146N)	DATE SAMPLED	14/03/2019
ADDRESS OF CLIENT	KASESE	SOURCE LOCATION	Kilembe, Kasese	DATE RECEIVED	16/03/2019
LABORATORY NO	E37018	SAMPLED BY	CLIENT	ANALYSIS COMPLETION DATE	26/03/2019

METHOD CODE	PARAMETER	TEST RESULTS	National Drinking Water Standards	METHOD CODE	PARAMETER	TEST RESULTS	National Drinking water Standards
1020	pH (pH Units)	6.7	6.0 - 8.5	1220	Total Phosphorus-P (mg/l)	0.25	2.2
1030	Electrical Conductivity (µS/cm)	54	1000	1240	Biochemical Oxygen Demand (mg/l)	15	
1041	Total Dissolved Solids (mg/l)	38	1200	1250	Chemical Oxygen Demand (mg/l)	20	
1050	Suspended Solids at 105Degrees Centigrade (mg/l)	2	5	1260	Flourides	0.0800	1.5
1060	Turbidity (NTU)	1	5	ICP-OES	Chromium (Cr)(mg/l)	0.0048	0.050
1070	Total Alkalinity (mg/l) as Calcium Carbonate	11		ICP-OES	Lead (Pb)(mg/l)	<0.0002	0.010
1070	Bicarbonates (mg/l)	13		ICP-OES	Arsenic (As)(mg/l)	<0.001	0.010
1080	Total Hardness (mg/l) as Calcium Carbonate	165	300	ICP-OES	Copper (Cu)(mg/l)	0.0085	1.000
1080	Calcium (mg/l)	150	150	ICP-OES	Zinc (Zn)(mg/l)	<0.0002	5.000
1080	Magnesium (mg/l)	4.20	150	ICP-OES	Cobalt (Co)(mg/l)	0.0071	0.500
1090	Sodium (mg/l)	17.3		ICP-OES	Nickel (Ni)(mg/l)	<0.0005	0.500
1100	Potassium (mg/l)	5.1		ICP-OES	Manganese (Mn)(mg/l)	0.0067	0.100
1110	Reactive Phosphorus-P (mg/l)	0.065	10	ICP-OES	Selenium (Se) (mg/l)	0.0404	0.500
1140	Chloride (mg/l)	6.2	250	ICP-OES	Beryllium	0.0080	
1150	Sulphates (mg/l)	6	400	ICP-OES	Iron(Fe) (mg/l)	0.0318	1.500
1170	Ammonia-N (mg/l)	0.221	0.5	ICP-OES	Molybdenum (Mo)(mg/l)	<0.001	
1180	Nitrates-N (mg/l)	0.966	10	ICP-OES	Aluminium (Al)(mg/l)	<0.001	0.500
1190	Nitrites-N (mg/l)	0.060	0.9	ICP-OES	Mercury (Hg)(mg/l)	<0.0001	0.001
1200	Total Nitrogen (mg/l)	1.1	10	ICP-OES	Cadmium (Cd)(mg/l)	0.0069	0.003

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THE REPUBLIC OF UGANDA

MINISTRY OF TOURISM, WILDLIFE AND ANTIQUITIES

Report
For

Pre-Feasibility Study on the Proposed Cable Car System and Ancillary Facilities in the Ruwenzori Mountains National Park

Prepared and Submitted by:
Civil-com Limited

FEBRUARY 2017

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0.0 EXECUTIVE SUMMARY

The consultancy services for Pre-Feasibility Study on the Proposed Cable Car System and Ancillary Facilities in the Ruwenzori Mountains National Park was a result of the intention of the Government of Uganda through the Ministry of Tourism, Wildlife and Antiquities to assess the viability of constructing a cable car system in the Rwenzori to unlock the tourism potential of the Rwenzori and Queen Elizabeth National Parks.

A consultancy contract was signed between the Government of Uganda and M/s Civil-com Ltd for the preparation of prefeasibility Studies and reports for the above mentioned works.

This is the Prefeasibility Report for the viability of a Cable Car System and Ancillary Facilities in the Ruwenzori Mountains National Park.

In undertaking this study, the project team reviewed relevant literature from the stakeholders, conducted road trips to the sites, conducted helicopter trip for aerial views and conducted preliminary market research for the demand of the cable car in the Rwenzori.

The team considered weather conditions of the proposed routes and assessed the topography, soil characteristics, social, economic and technical aspects of all alternative routes. A preferred option was chosen; this is the *Mihunga gate – Panga Ridge to Portal Peaks* route. This route lies in the Mubuku valley

The base station will be established at Panga Ridge while the top station shall be at portal peaks where all the peaks of the Rwenzori Mountains can be seen. An access road or rail track shall be constructed from Mihunga gate to Panga ridge station.

The project team found out that development of the cableway along this route would be feasible.

Development of a cableway facility at the selected site would not be without potential challenges, which will have to be overcome if such a development was to attract capital funding and ultimately operate sustainably. These challenges include the need to improve the condition of the roads providing access to the proposed site and the need to thoroughly develop tourist attractions in the neighborhood of the selected site in order for the cable way and other surrounding facilities to attract sustainable numbers of cultural, business and eco-tourists.

Constructing a cable car system via the proposed route is estimated to cost Thirty million, eight hundred thousand US Dollars {USD 30.8m} equivalent to UGX 113,975,885,000/=

Full details of these findings are spelt out in the accompanying report.

1.0 Introduction

1.1 Purpose

The Tourism Sector Development Plan of 2015/16-2019/20 of Uganda has identified a cable car system as development project that can help increase tourism numbers and help contribute to the attainment of Uganda's middle income status. In January 2017, the Ministry of Tourism, Wildlife and Antiquities of Uganda commissioned a team of consultants to prepare a pre-feasibility study on the possibility of developing a cable car system as a tourism product in the Rwenzori Mountains .**M/s. Civil-Com Ltd of P.O. Box 7478 Kampala, Tel +256-774-620-042 (**consultants**)** of Uganda was contracted to undertake this study.

In Feb 2017, the Project Team conducted preliminary investigations, site visits, helicopter fly over and consultations with the local stakeholders and authorities.

The purpose of this Draft Report is to present the results of the findings of the site visits in consultations with the local stakeholders, the viability of developing a cable car system in the Rwenzori Mountains in terms of engineering, environment and financial aspect of the project.

1.2 Report Structure

- Chapter 2 outlines the Study Objectives and Study Area boundary.
- Chapter 3 will report on the activities and findings of the Site Visits
- Chapter 4 will discuss the various cable car systems and the alternative alignments that have been recommended by the team after due consultations with the local stakeholders and authorities as well as preliminary station layouts
- Chapter 5 will present preliminary cost estimates of the cable car developments
- Chapter 6 will present the conclusions of this Preliminary Feasibility Study
- Chapter 7 will present the Terms of Reference for the Next Stage

2.0 Study Objectives and Study Area

2.1 Study Objectives

Overall Objective

Having identified the Rwenzori National Park and mountains as a key tourism area of Uganda with its vast potential for upgrading and development, the overall aim of this prefeasibility study is to now identify potential and suitable sites for the development of a cable car route.

The following factors during the study were taken into consideration; ease of accessibility by Road, give the best views along the route and at the top station and also serve as a launching pad for further exploration and development of the mountains into eco-friendly tourism attractions.

The Study was based on the terms of reference outlined by the Ministry of Tourism, Wildlife and Antiquities of Uganda.

The specific objectives are provided in the following sections.

- ✓ Location of the Cable Car Route System
- ✓ Recommend the specific cable car system most suitable in terms of use, capacity, ease of maintenance and operations
- ✓ Conduct preliminary cost estimate of the system recommended
- ✓ Propose various station layouts and designs
- ✓ Prepare preliminary feasibility studies on the economic viability of the project

2.2 Study Area Boundary

2.2.1 Overall Study Area Boundary

2.2.1.1 The overall Study Area boundary is shown in Figure 2.1 and Figure 2.2

The Study area is centered around the town of Kasese which is just outside of the northeastern edge of the Queen Elizabeth National Park. Kasese is approximately 345 kilometres (214 mi), by road, west of Kampala, Uganda's capital and largest city and is also accesible via the Uganda Railways. The town has been a traditional gateway to both the Queen Elizabeth National Park and the Rwenzori National Park.

There is an airfield in Kasese which has the potential to be turned into a regional airport catering for bigger airplanes like Boeing 737 or Airbus 320's. With improvements in these three modes of transports, Kasese will have the potential of becoming a premier tourist attraction of Uganda offering a variety of tourism products ranginging from the lakes to the mountains and local culture.

There are presently two gateways to the Rwenzori Naional Park; the Mihunga and Kilembe Gates.Based on the helicoper survey, the trekking guide maps and the stakeholder consultative meeting, Mihunga and Kilembe gates best fit the criteria for the selection of cable car route.

During the Study we investigated the characteristics of each gateway and proposed a final alignment for consideration.

Fig 2.2: A map showing current trekking routes to the mountain peaks

3.0 Report on the Site Visit

3.1 Description of the Rwenzori Mountains Flora and Fauna

The Mountain range is only 80 miles long but contains one of the most dramatic diversities of ecosystems in the world; just a few miles from each other are the heat of tropical jungles and the cold of glacial ice. In fact, there are five distinct zones of habitation generating a world of amazing biodiversity.

At the base is the African SAVANNA teeming with animals including elephants and zebras. This zone is mostly between about 3,000 and 5,500 feet (914 - 1,676 m.). Above the grasslands is the RAINFOREST from 5,500 to 7,500 feet (1,676 - 2,286 m.). Here are giant ferns, wild banana trees and lianas.

Above the jungle is the great BAMBOO forest, reaching up to around 9,500 feet (2,895 m.). Bamboo, a type of grass, can grow up to three feet a day here, and reach over a hundred feet in only two months.

Above the bamboo is the HEATH zone. This zone extends up to around 12,000 feet (3,657 m.) or so, and is a land of dripping lichen-covered heather trees looming over a ground cover of mosses and liverwort. The trees, although 40 feet tall or so, are relatives of the low shrub growing in the Scottish moorlands;

Going higher, there is the ALPINE zone, above 12,000 feet (3,657 m.), a land which in its lower sections is dominated by giants. Here are plants unique only to the Afro-Alpine zone, including the tree groundsel and giant lobelia. The upper reaches of this zone, extending up to around 14,500 feet (4,419 m.), consist mostly of rocky terrain covered with black lichens and brown mosses.

Finally, above 14,500 feet and reaching to Margherita Peak at 16,763 feet (5,109 m.) the highest point in the range, atop Mount Stanley, the Rwenzori Mountains are wrapped in permanent snow and storm-swept glaciers.

3.2 Description of the Geology of the Rwenzori Mountains

The Rwenzori Mountains are a fault block mountain range that was formed due to the rifting that was taken place in East Africa over the past 10 million years. Most of the rocks of the range are metamorphic in nature, largely gneisses in the northern and southern parts of the range, and a metamorphosed igneous rock, amphibolites, among the high central peaks. The uplifted mountain has subsequently been sculptured by rivers and repeated

growth of glaciers, resulting in six separate mountains rising over 4500m (Mts. Stanley, Speke, Baker, Gessi, Emini and Luigi di Savio). There is also some seismicity within the Rwenzori Mountains.

3.3 Brief from meetings with the stake holders

A meeting was held on 21 February at the office of the UWA Park office near the Mihunga Gate. It was brought to the attention of the team that there are already existng tracking routes to different view points that is to say Mihunga and Kilembe routes with each route having its pros and cons as shown in the comparison table. There are other routes that have not been setup but with implementation of this project, access to peaks and view points will be made easy for tourists.

Currently, trekking services are carried out by only two companies. Rwenzori Mountaineering Services is the only organiser of trekking services on the Central circuit route while Rwenzori Trekking Services handles activities on Kilembe route.

3.4 Brief on the helicopter trip

A meeting was held on 21 February at the office of the UWA Park office near the Mihunga Gate. A discussion was held with the stakeholders to chart out a course for the helicopter trip to be taken the next day. The meeting discussed a possible flight path that can allow the team to forward their views on possible locations of the cable car.

As part of the prefeasibility study, a helicopter fly over the study area was conducted on 22 February 2017. The local stake holders, namely the Park Rangers led by Mr James Okware and a number of local trekking guides were invited to partake in this trip.

3.5 Brief on the road trip to Mihunga Gate

To access the Mihunga Gate, we went through a 17 Km gravel access road from Fort Portal – Kasese Highway. The road traverses the villages of Bugoye and Ibanda and provides easy access to the gate.

There are many resorts on the road to the Mihunga Gate; Piped water is available and can easily be extended to other parts in case there is need. However there is no power at the gate but power lines can easily be extended to the gate or find other sources of power at the gate and beyond.

The vegetation along this route is still undisturbed and there is no human settlement in and around it.

3.6 Brief on the Road trip to Kilembe Gate

Kilembe Gate is 13 Km from Kasese town accessed through the Kasese Kilembe road. The road to this gate is paved up to the Kilembe mines and then turns into a gravel road accessible by cars up to some point where it turns into foot path. Also to note, parts of the paved road especially in the mines have been greatly damaged however it still needs upgrade because it's badly damaged by floods from river Nyamwamba. There is a lot of

human settlement and less vegetation cover because of the settlements. However there is power up to the gate and also water supply and it can be extended to other areas. We found less accommodation around the area

4.0 Cable Car system and Alignments

4.1 Description of Cable Car systems

The first ropeways were mainly built to transport goods in an efficient way from one point to another. Presently, there are 5 different types of cable car systems available which are being used to carry goods, passengers and even heavy machinery.

4.1.1 Types of Cable car systems

i) An Aerial Tramway

Figure 1: Aerial Tramway cable car system

An aerial tramway consists of two large cabins with a carrying capacity ranging from 50 to 100 persons being pulled by a haul rope on top of a Track Rope which functions like the railways of a railway. The Haul rope is pulled by a motor via a series of gears and a bull wheel. Hourly passenger carrying capacity will range from 500 to 2,000 passengers

Figure 2: Cabins of aerial tramway system

ii) Funicular Railway

Figure 3: Finicular rail track

Basically, funiculars are railway cars running on rails, pulled by a wire rope. To move the cars, friction or winch drives are used. The drawback of funiculars is that a track has to be cut on the ground and foundations for the rails have to be built, This is not very environmentally friendly in this modern era but will be useful to be applied underground on inclined slopes and requiring high capacity of transport.

Figure 4: The old and new Penang Hill Funicular System

iii) Mono-cable, bi-cable and tri-cable gondola systems

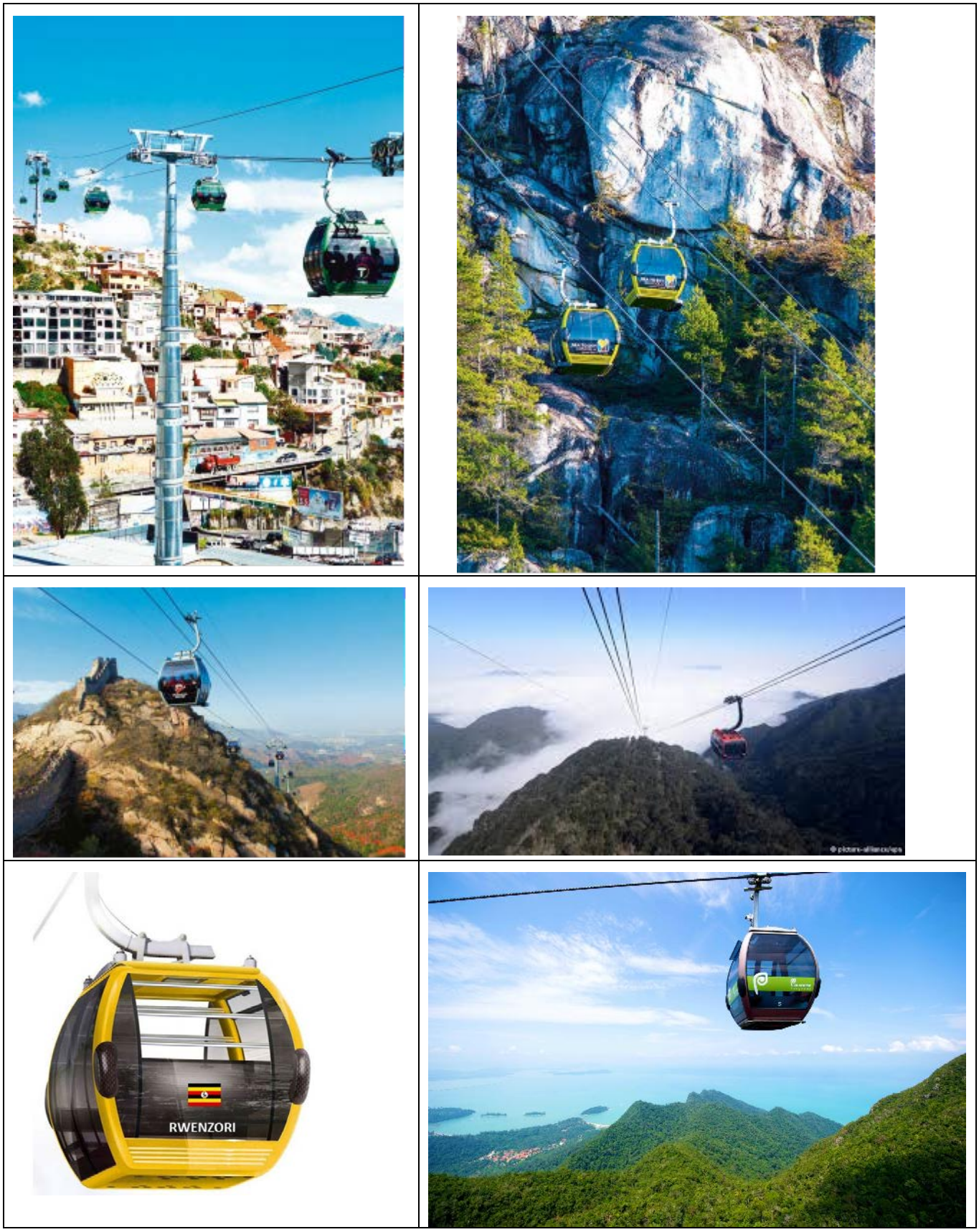


Figure 5: Pictures of Gondola systems and cabins

4.1.2 Cable car equipment

Cable car equipment consists of drive system, rope and cabins. It is a complex system of attaching a cabin onto a moving rope with equipment that slows down the cabins in the stations to allow passengers to board and de-board and accelerate the cabins before attaching on to a rope around a bull that is driven by electric motors.

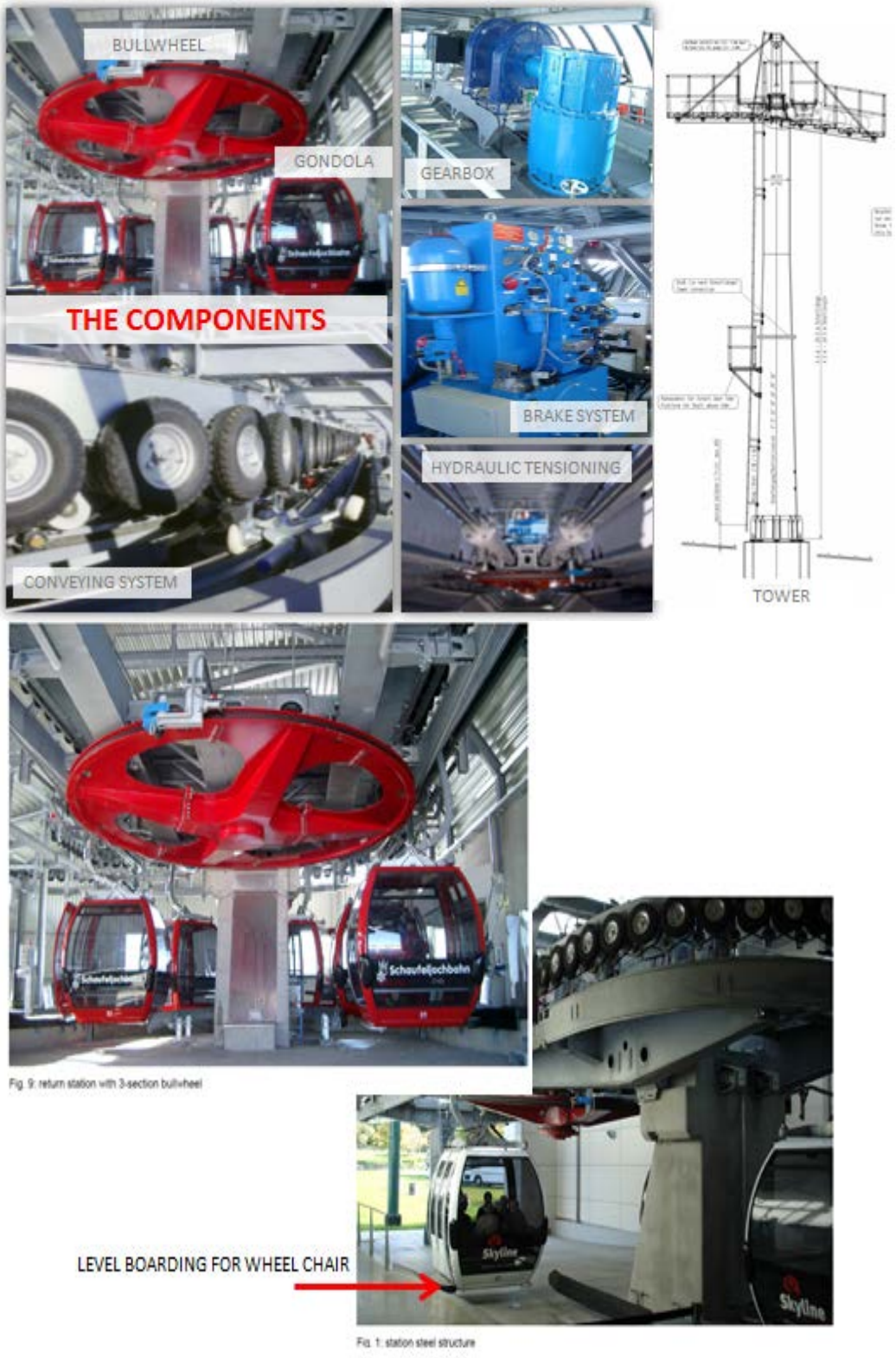


Figure 6: Component parts of a cable car system

4.1.3 Cable car ride experience

- Cable cars ferry passengers on a rope high above the ground in 8 to 15 seater cabins. They will glide in the air at speeds of up to 5 meters per second. The cabins are weather proof and will shelter passengers from wind and rain.
- Passengers have 360 degree views of their surroundings and even below into the ground in glass bottomed cabins.
- In the case of the Rwenzori cable car, they will be able to glide above the forest and have a bird's eye view of the surroundings.
- There are many types of gondola cabins available and the cabins can be designed and painted to suit each individual requirement.
- The boarding of the cabins are done at a flat level thereby allowing handicapped people on wheelchairs to board and got up to the top. This is one of the unique features of a cable car system.

Figure 7: Glass bottom Gondola cabin

Figure 8: VIP Gondola cabin

4.1.4 Environmental friendliness of cable car systems

Cable car systems are considered one of the most environmentally modes of transportation; the system is powered by clean energy electricity and does not pollute its environment.

The buildings and towers supporting the cables have very small footprints on the ground; Construction of these facilities does not degrade the surrounding environment and with new technologies do not require roads to be built to service the top stations.

Figure 9: ***trees still growing right next to the footings during construction***

Figure 10: Helicopter carrying a tower during construction

4.1.5 Expansion capabilities

- The monocable gondola system has expansion capabilities whereas the jig back has limited expansion capabilities.
- To cater to future expansion, the stations, drive and control system, tower support and haul rope are designed and installed to final capacity. The initial capacity is achieved by installing less number of gondolas.
- In the Rwenzori case, an initial capacity of 500 passengers per hour will be specified and a final capacity of 1,000 per will be installed.
- Final capacity will be achieved just by adding extra gondola cabins.

4.1.6 Safety features of cable car systems

Cable car systems are built to transport people and the safety of the passengers is of the utmost importance. Safety features are incorporated in the design, construction and operations of the system to ensure that the system is failsafe and rescue of passengers can be achieved safely and expeditiously

- All cable car systems are designed according to international standards of safety.
- To ensure failsafe operations, there are 2 motors to drive the system, an operating and a standby system. The power supply system is also double, with a power grid supply and a standby generator set supply.
- All controls and sensors in the system have back up units.
- Rescue and evacuation devices are standard equipment in all cable car systems
- All cable car operating personnel are trained together with local authorities in rescue and evacuation
- An ERP (Emergency Response Plan) has to be drawn up for all operators.

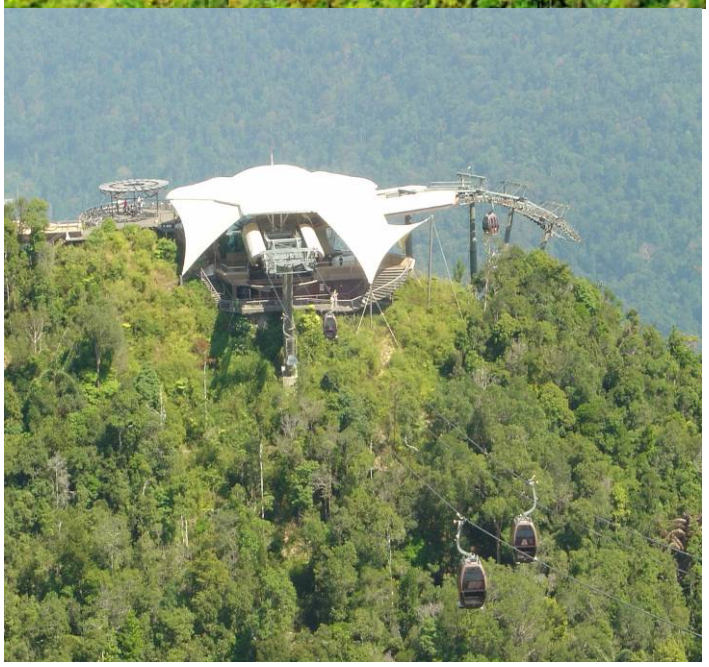
4.1.7 Operation and Maintenance

- Before commencement of operations to the public, the cable car system and operators must undergo an inspection and tests by an internationally certified inspector who has to certify that the system is safe for public use. These tests are carried out according to the manufacturer and inspectors code.
- All operators and personnel running the cable car system will have to undergo rigorous training on the operations and maintenance of the system and must adhere strictly to the operation manuals drawn up for each system. These operating and maintenance standards must comply with international standards

- The operators must conduct daily, weekly, monthly, quarterly, bi-annual and annual checks on the system as drawn up in the operating manuals.
- The system will have to be inspected by internationally certified cable car inspectors at least once a year. These inspectors will certify that the system is safe for operations.
- The operators will also have to replace wear and tear parts of the system according to the designated usage.
- A list of spare parts will also have to be kept ready at all times to replace any defective parts immediately.

4.1.8 Comparison of systems and selection

		JIG BACK	GONDOLA
1.	CAPACITY	500 to 3000 pax per hour	500 to 3000 pax per hour
2.	CONSTRUCTION	▪ Need steep inclines for bigger spans	▪ Can adapt to any inclination of the slopes
3.	TOWERS	▪ Less number of towers ▪ Can go for steep inclines	▪ Needs more numbers of towers
4	TOWER SPANS	▪ Can have longer spans and steeper inclines	▪ Maximum span of 1000 meters
5	CABINS	2 only	Variable depending on capacity
6	FOUNDATIONS	Bigger	Smaller
7	DRIVE EQUIPMENT	Bigger	Smaller
8	ROLLER SHEAVES	Less	More
9	ROPE SPEED	Variable 0-10 METERS/SEC	Variable 0-6METERS/SEC
10	OPERATIONS	Start stop operation	Continuous variable speed
11	MAINTENANCE	Simpler but heavier parts	More moving parts
12	EXPANSION CAPABILITIES	Not possible	Can be designed for smaller initial capacity and higher final capacity



The mono-cable gondola ropeways offer a highly comfortable ride and are the system of choice for feeder services in ski areas, tourism resorts and the jungle environment. The enclosed carriers provide full protection against the elements, and have been designed with a strong focus on the special needs of families and the elderly.

The gondolas are attached to the haul rope with detachable grips for safe and easy loading and unloading, with the carriers travelling through the terminals at creep speed before accelerating to a line speed of up to 6 m/s.

Hourly capacity of the system depends on the speed, distance and number of cabins or gondolas.

The system proposed for the Rwenzori Cable Car has a maximum speed of 5 meters per second and a total of 28 gondolas giving a initial capacity of 500 passengers per hour.

Capacity can be increased to a maximum of 1,000 passengers per hour by adding more gondolas.

Recommended system

After taking into consideration the various systems available, the construction methods for each system, it is recommended that the mono-cable gondola system like the one in Langkawi, Malaysia be used for the Rwenzori Cable Car installation with an initial capacity of 500 passengers per hour and final capacity of 1,000 passengers.

4.2 ALIGNMENT STUDY

4.2.1 PLAN SHOWING ALTERNATIVE ALIGNMENTS

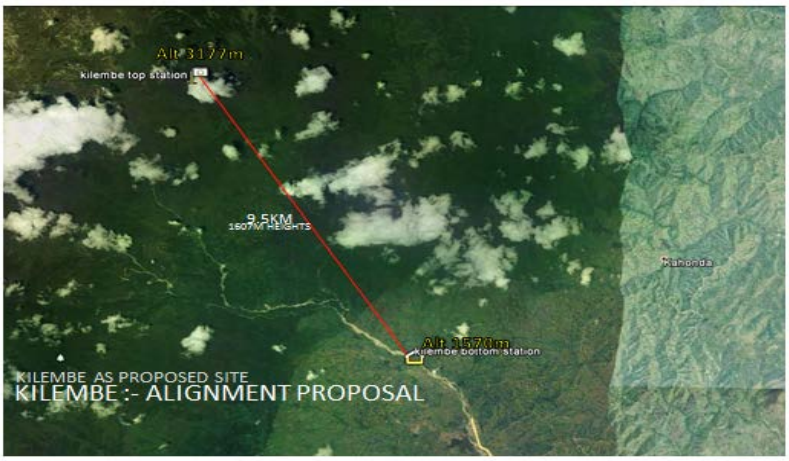
There are presently two established staging points for trekkers to the mountains of Rwenzori, namely the Mihunga Gates and the Kilembe Gates. The guides have informed that although the Kilembe Gates were recently established, it has grown in popularity among trekkers.

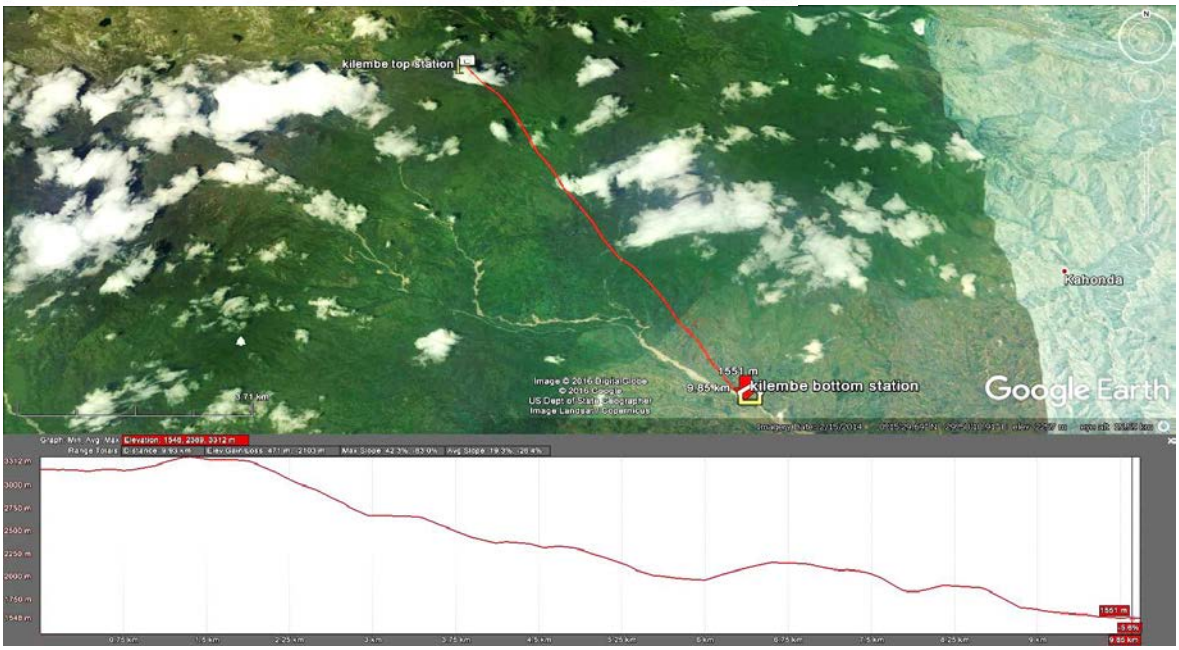
4.2.2 The Kilembe Site

The Proposed Lower Station for the Kilembe Line is located 13.5 km from the Kasese main road. The road will traverse through the Kilembe Mines and workers quarters. The road is paved up to Lower Station location but the condition of the road is bad due to erosion from the recent floods.

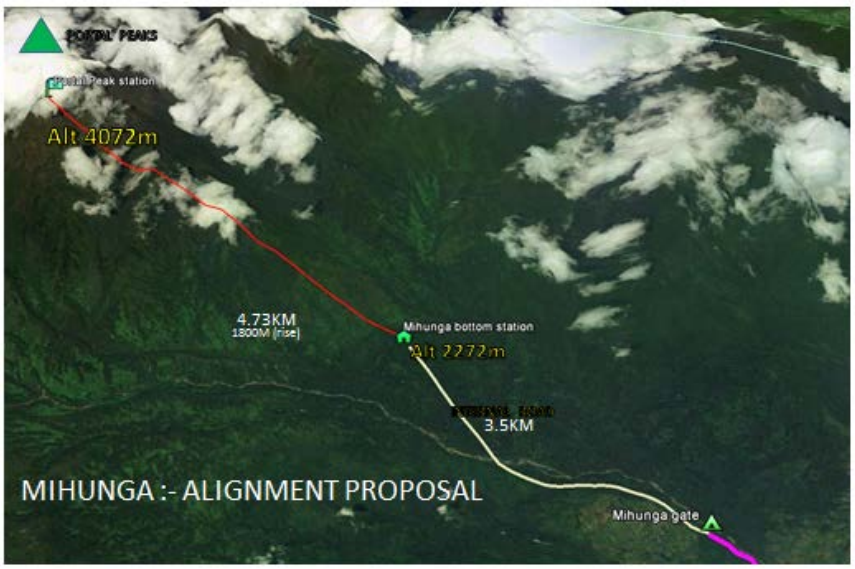
Water and electricity supply is available from the Kilembe Mines but some money has to be spent to upgrade the access road to cater to increased vehicular traffic bringing in the visitors to the cable car station.

In order to get a good view of the Rwenzori, the Top Station is proposed to be located at 3,177m above sea level and 9.5 km from the Lower Station. If constructed, it would be the longest cable car system in the world. It will take at least 30 minutes to travel from the Lower to the Top Station. The line will rise from an elevation of 1,570 to 3,177 meters above sea level giving an elevation difference of 1,607 meters





4.2.3 THE MIHUNGA SITE



The Proposed Bottom Station at the Mihunga Alignment is located 3.5 km from the Mihunga Gates; elevation 1,752m which is located about 17km from the Fort Portal-Mpondwe trunk road. This 17km road is not paved but it is generally well maintained. However, if this alignment is chosen, this road has to be paved. Electricity supply will have to be extended from the main road.

The proposed Bottom station which is at an elevation of 2,272 meters is another 3.5km from the Mihunga Gates. A new paved access road will also have to be built. However, this access road will be a narrow single lane road restricted to light vehicles carrying visitors on a tractor pulled train from the Mihunga Gate and for cable car maintenance and emergency vehicles access. No private vehicles will be allowed to enter that road. All visitors will have to park their vehicles at the Mihunga Gate which will be developed into the main gateway with ticketing, F&B, shops and all other facilities.

The Bottom Station has an elevation of 2,272m and The Top Station at Portal Peak which has an elevation of 4,072m is 4.5km from the bottom station.

4.2.4 Comparison between Kilembe and Mihunga Gates lines

		KILEMBE GATES	MIHUNGA GATES
1.	ROAD ACCESS	Access to the Kilembe Gates is via a 13km paved road from the Fort Portal-Mpondwe trunk road. That road passes through the Kilembe mines but has been badly damaged by the recent floods.	Access to the Mihunga Gates elevation 1,772m is through a 17km road from the Fort Portal-Mpondwe. This road is not paved but it passes through the villages of Bugoye and Ibanda. Paving this road will bring benefits to the residents living along the road. Another 3.5km paved track has to be built to the proposed bottom stations at elevation 2,272
2.	POWER SUPPLY	3km away from the gate	4.0km away from the gate
3.	WATER SUPPLY	Available	Available
4.	ALIGNMENT DISTANCE	9.5km	4.7 km
5	Elevation of Station	Bottom : 1,570 m Top : 3,177 m Rise : 1,607 m	Bottom : 2,272 m Top : 4,072 m Rise : 1,800 m
6	VIEWS ENROUTE/RIDE EXPERIENCE	• Queen Elizabeth National Park, • Kilembe copper mines • weismanns peak, • Nyamwamba valley • Hot Springs	Lakes Bujuku, Bukurungu, Edward and George; Queen Elizabeth National park, Mubuku Valley
7	VIEWS AT THE TOP	• Margherita peak • Mount Baker • Mount Speke • Congo ranges • Lake kachope, Batunda and Karisimbi • Nyamugasana valley • Queen Elizabeth National Park	• All peaks i.e Margherita Peak,Alberta, Baker, Edward, Speke, Gesse, and Emin; • Lakes Bujuku, Bukurungu, Edward, George • Kinyankoma ridge • The Congo ranges • Hima valley • Queen Elizabeth NationalPark
8	SORROUNDING ACCOMODATION	A few resorts belonging to RTS and along the road from Kasese	Resorts along the road from Kasese to the gate
9	CURRENT POPULARITY	Popular because of the Kilembe copper mines	Popular as the tracks have been existing

The Kilembe Line rises from an elevation of 1,570 to 3,177 m a height difference of 1,607m. The alignment is 9.5 km long. Such a line will be expensive to build and will cost at least USD 30 Million

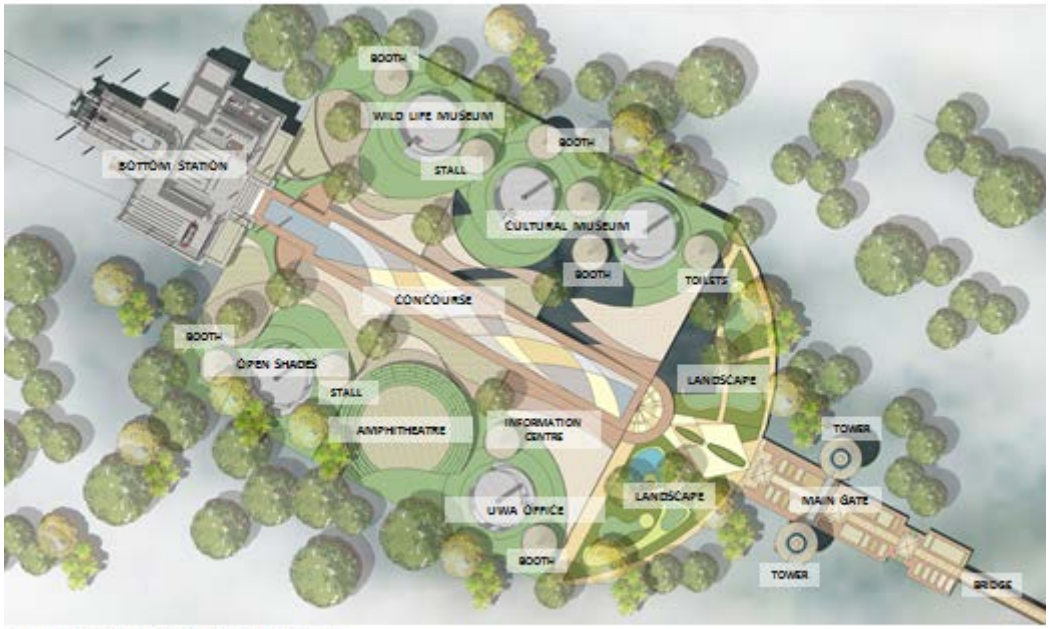
The Mihunga Line rises from an elevation of 2,772 to 4,072m a height difference of 1,800 m. The line is shorter and will be easier to build. This line costs around USD20 Million although the paved track from the Mihunga Gate to the station has not been costed in. It would seem that the Mihunga Line would still be less costly even if the cost of the 3.5km track is taken into consideration.

The new track to the Bottom Station from the Mihunga Gate will provide access to trekkers to the Rwenzori Mountains and also serve as tourism product bringing visitors into the inner sanctums of the Rwenzori.

We shall use the Mihunga line for the planning of the station buildings and layouts.

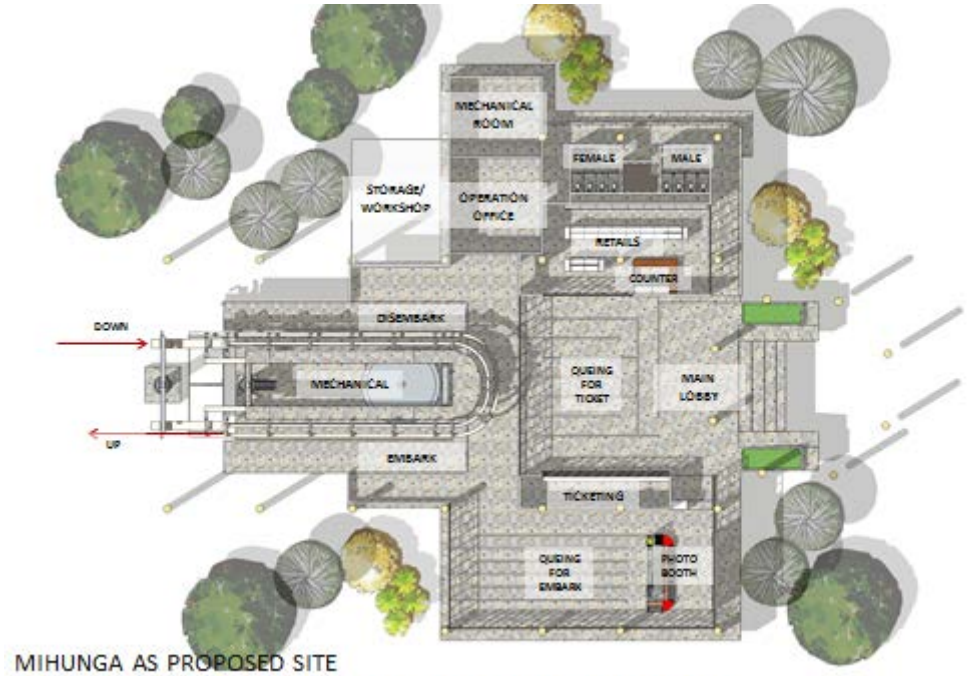
4.3 PROPOSED STATION LAYOUT PLANS

Mihunga alignment bottom station at Panga ridge



MIHUNGA AS PROPOSED SITE
NEAR PANGA RIDGE : - SITE PLAN

The Bottom Station will house all the drive equipment for the cable car. All the gondolas will be brought down to be stored at the gondola parking area. The Bottom Station concourse will also house a host of other facilities.



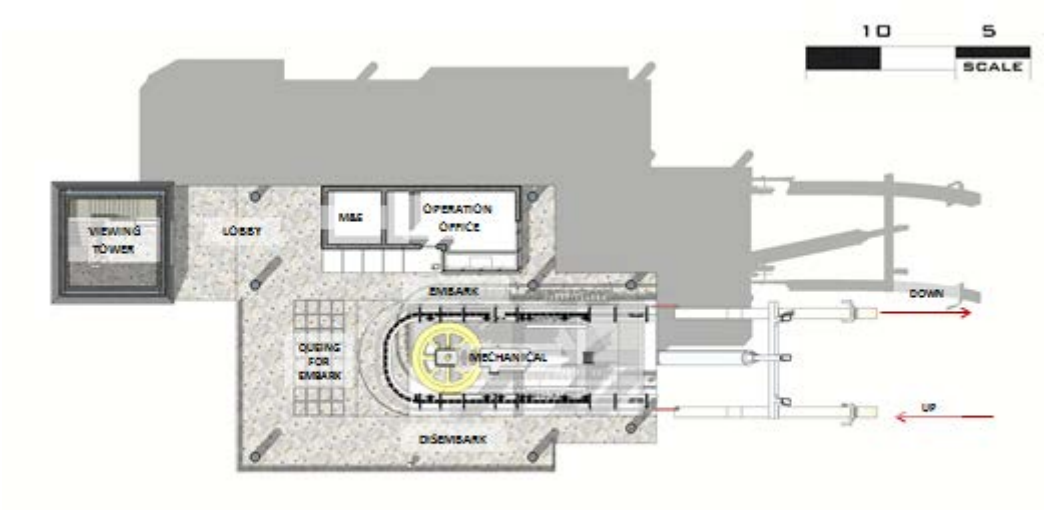
MIHUNGA AS PROPOSED SITE
NEAR PANGA RIDGE: - BOTTOM STATION PLAN

MIHUNGA AS PROPOSED SITE

NEAR PANGA RIDGE: - BOTTOM STATION ELEVATIONS

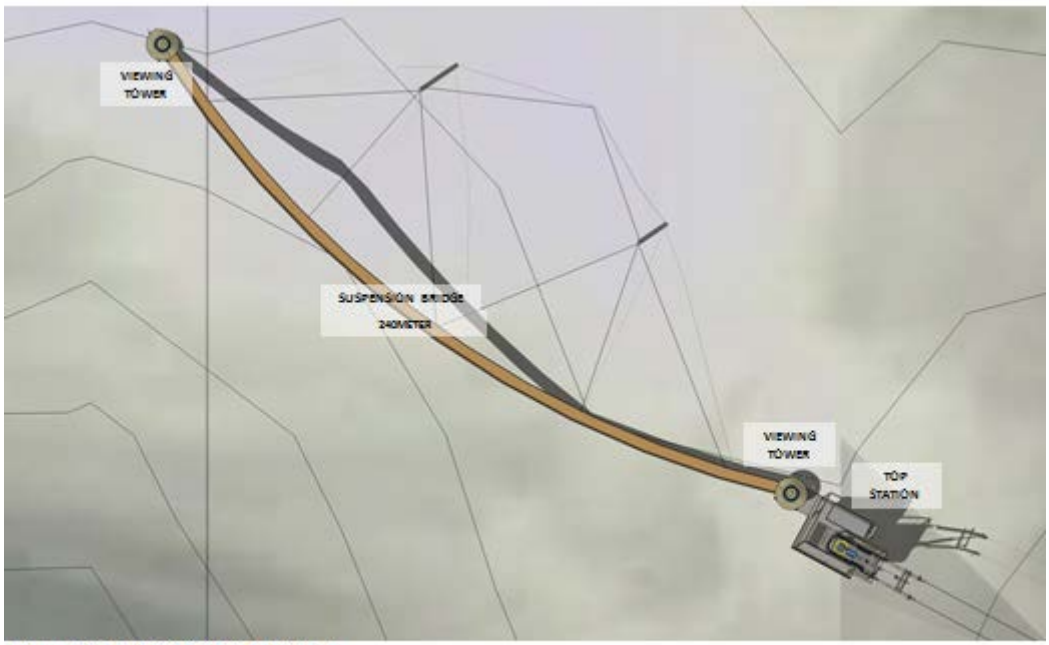
MIHUNGA AS PROPOSED SITE

NEAR PANGA RIDGE: - BOTTOM STATION ELEVATIONS



MIHUNGA AS PROPOSED SITE
NEAR PORTAL PEAKS: - TOP STATION PLAN

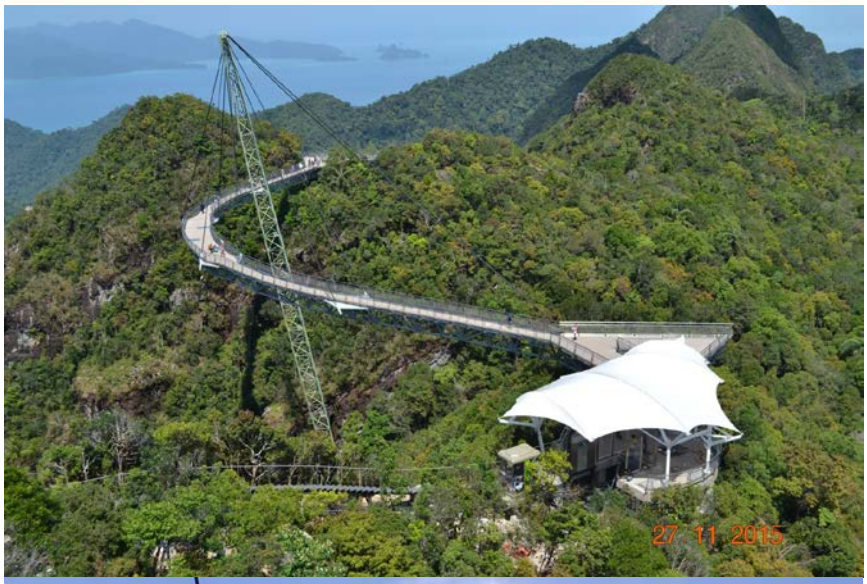
MIHUNGA AS PROPOSED SITE
NEAR PORTAL PEAKS: - TOP STATION ELEVATIONS

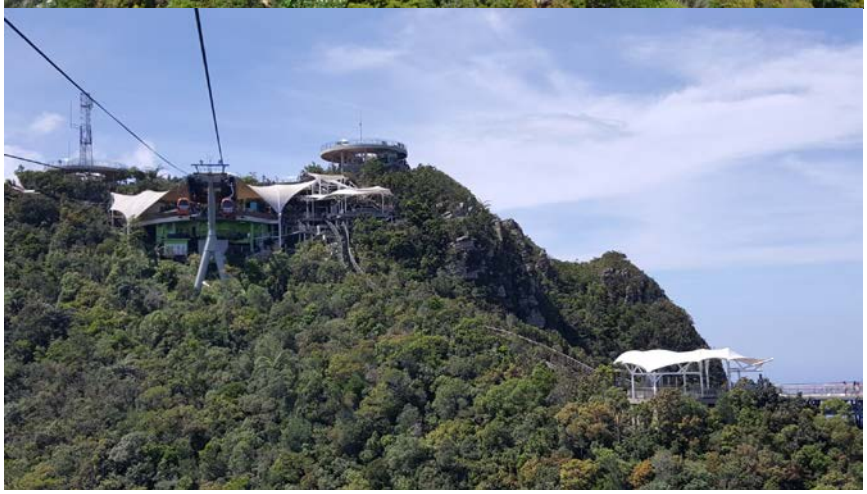


MIHUNGA AS PROPOSED SITE
NEAR PORTAL PEAKS: - SITE PLAN

Visitors to the Top Station will not be allowed to wander out of fenced out areas; they will only be allowed to move around the walkways which will be built around the station

The pictures show how visitors are guided and controlled when they are up on the mountains





5.0 FINANCIAL ESTIMATES

5.1 Cost estimates

Without detailed designs and investigations on the soil conditions at the various sites, we can only make rough estimates on the costs of building the station buildings, the power supply required and the costs of the electro mechanical equipment.

The costs of manpower and equipment involved in building the installation varies according to the method of construction and it will include using helicopters and even hundreds of porters to assist in bringing up materials and equipment to build the towers and buildings at the top of the mountain. A more detailed cost estimate can only be determined at detailed design stage.

However, based on previous experiences, we have now come up with an estimate of the costs of two lines at the Kilembe and Mihunga Gates respectively for a mono cable-eight seater gondola cable car system with an initial capacity of 500 passengers per hour.

ESTIMATE COSTS FOR CABLE CAR TO MOUNTAINS OF RWENZORI

		ELEMENTS		KILEMBE	MIHUNGA
A	**EQUIPMENT COST**		**USD**		
I	Cable Car Equipment with electro-mechanic equipment			18,000,000.00	15,000,000.00
	*	Cables			
	*	Station equipment			
	*	Mechanical equipment			
	*	Electrical equipment			
	*	Cabins			
	*	Working Cable		-	-
	*	Helicopter		4,000,000.00	2,000,000.00
II	Local works for cable car including towers				
		250 tons for A 200 for B	3,000/Ton	3,000,000.00	1,000,000.00
B	**CIVIL WORKS**				
		Upgrading of 17km road and 3.5 km track			3,000,000.00
I	**LOWER STATION BUILDINGS INCL SUBSTRUCTURE WORKS**				
	(i)	Survey and Soil Investigation			
	(ii)	Site preparation/protection			
	(III)	Building Works incl. car-park			
				5,000,000.00	2,000,000.00
II		**UPPER STATION**			
	(i)	Survey and Soil Investigation			
	(ii)	Site preparation/protection			
	(III)	Building Works			
				8,000,000.00	3,000,000.00
C		**M & E INFRASTRUCTURE**		1,000,000.00	1,000,000.00
D	**PRELIMINARIES**			2,000,000.00	1,000,000.00
				41,000,000.00	28,000,000.00
E	**PROFESSIONAL FEES 10%**			4,100,000.00	2,800,000.00
			TOTAL COST	**45,100,000.00**	**30,800,000.00**

5.2 Preliminary feasibility Market study

5.2.1 Market overview

Tourism is one of the largest – some even say it is the largest – industry in the world. According to the World Tourism Organization (WTO), over the last decade, international tourism (travel between) countries have now reached a total of 1.5 Billion international arrivals in 2015. Individuals are travelling significantly more internationally per capita than they did 10 years ago.

- International tourist arrivals grew by 4.6 % in 2015 to 1,184 million
- In 2015, international tourism generated US$ 1.5 trillion in export earnings
- UNWTO forecasts a growth in international tourist arrivals of between 3.5% and 4.5% in 2016
- By 2030, UNWTO forecasts international tourist arrivals to reach 1.8 billion (UNWTO Tourism Towards 2030)

According to the latest available data, international tourism receipts i.e. the amount of money spent and worldwide earnings on international tourism reached a new record value of US$ 1.5 Trillion in 2015

The WTO Tourism Vision 2030 forecasts that international arrivals are expected to reach over 1.8 billion by the year 2030. Of these worldwide arrivals in 2020, 1.18 billion will be intra-regional and 377 million will be long haul travellers.

Tourism demand depends above all strongly on the economic conditions in major generating markets. When economies grow, levels of disposable income will usually also rise. A relatively large part of discretionary income will typically be spent on tourism, in particular in the case of emerging economies. A tightening of the economic situation on the other hand, will often result in a decrease or trading down of tourism spending.

In general, the growth of international tourism arrivals significantly outpaces growth of economic output as measured in Gross Domestic Product (GDP). In years when world economic growth exceeds 4 per cent, the growth of tourism volume tends to be higher.

5.2.2 Tourism in Uganda

The following are facts of Tourism in Uganda

- Uganda recorded a total of 1.73 million international arrivals and 1.71 million departures in 2015.

- Uganda is ranked no 8 in World Tourism rankings for the African continent. The number 1 tourism destination for the African continent is South Africa with nearly 10 Million visitors.
- The number of visitors to national parks increased from about 202,885 in 2014 to about 215,558 in 2015
- Tourists visiting Friends and Relatives in Uganda increased from about 441,000 in 2014 to about 510,000 in 2015.
- The most popularly visited national park in 2015 was Murchison Falls (34 percent), followed by Queen Elizabeth (30 percent) and Lake Mburo National Park (12 percent).
- 36 percent of the visitors to national parks were foreigners who are non-residents.

National Parks	**2013**
Murchison Falls National Park	70,799
Queen Elizabeth National Park	69,193
Kidepo Valley National Park	2890
Lake Mburo National Park	14,068
Rwenzori Mountains National Park	2,724
Bwindi Impenetrable National Park	21,695
Mgahinga Gorilla National Park	8,951
Semliki National Park	5,752
Kibaale National Park	15,782
Mount Elgon National Park	2,096
Total	213,950

5.2.3 Domestic Tourism

- Domestic tourism in Uganda has seen strong growth in recent years, although it was affected to some extent by disturbances in parts of the country in the past, it has now taken off with the increasing mobility and connectivity within the various parts of the country. The rising economic wellbeing and affluence of the Ugandan population and the emergence of a middle income population has also contributed to the increase in domestic tourism.
- The rise in domestic tourism reflects special promotions, an increased number of days taken as holidays and, above all, higher standards of living. Rapid

improvements in the transportation system have provided faster and easier access to tourism destinations.

- The Ugandan Government has launched a campaign to encourage the local population to visit the many interesting places in their home country instead of overseas. The local retiree population is a great potential market that is still relatively untapped.
- The building of budget and medium-priced hotels, and the restoration of historical sites, as well as the upgrading of public amenities, have also facilitated the development of domestic as well as international tourism, which is expected to expand further in 2016-19
- The site visits organised by schools are also an important part of domestic tourism
- To increase more domestic travel and tour, the private sector will be encouraged to provide better recreational facilities as well as accommodation ranging from high-end to the more affordable in order to cater for different target groups.
- Kasese is an emerging tourism destination being the gateway to the Rwenzori and Queen Elizabeth National Parks. A major local attraction in Kasese is also the mines museum in Kilembe. An estimated 47,000 students visited the mine in 2016;{Source: Rwenzori Trekking Services (U) Ltd}
- The Queen Elizabeth National Park attracted 70,000 visitors in 2013.
- Uganda has a wide of natural attractions that can be further developed and modernised to turn into additional tourism products that can cater to the increasing number of tourists coming in.

5.2.4 Visitor analysis & forecast

5.2.4.1 *Market Analysis*

The attendance projection guideline for developing cable cars is dependent on the following factors:

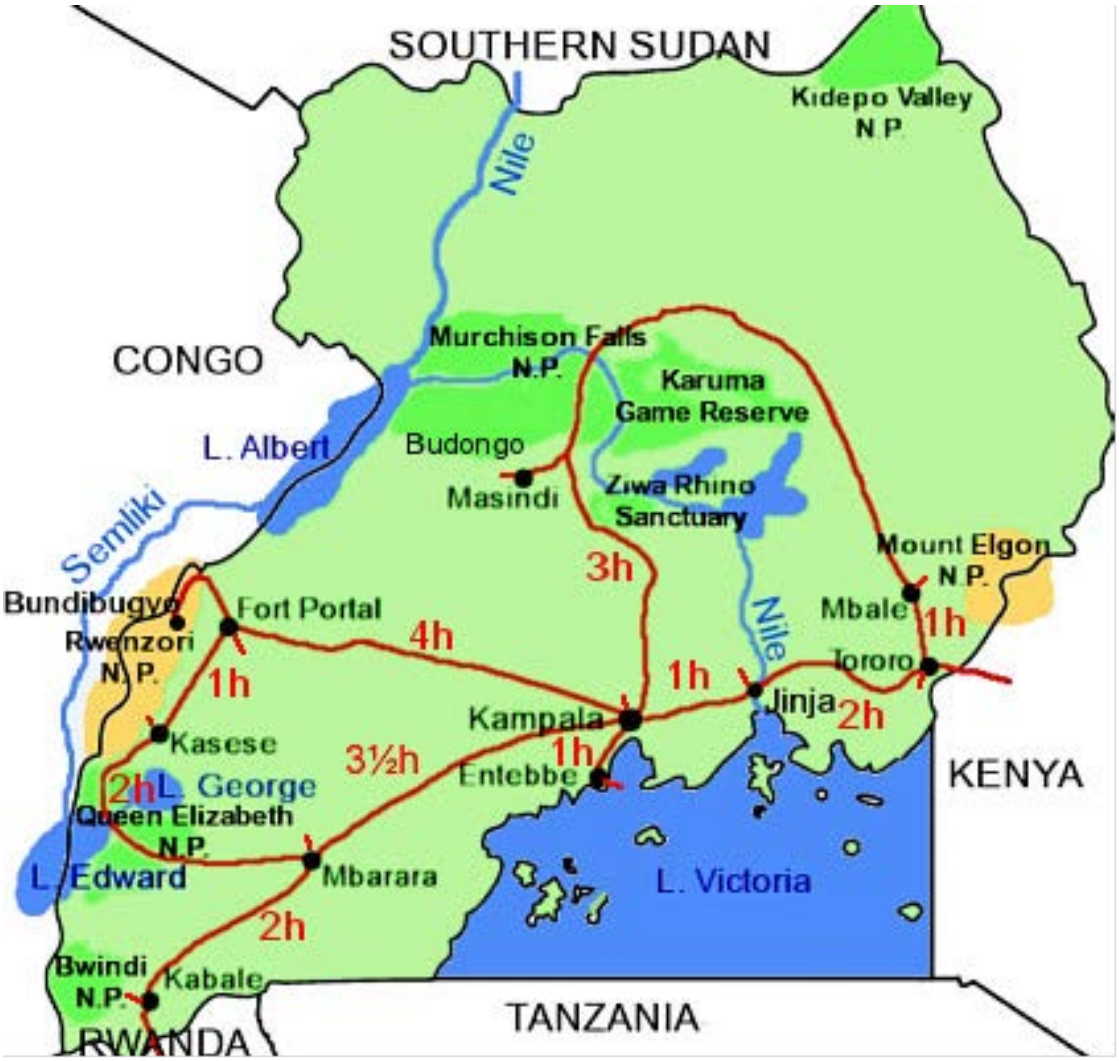
- ✓ The location and its accessibility
- ✓ The size and characteristics of the resident market
- ✓ The size of the available tourist market
- ✓ The amount of the investment and quality level of entertainment and facilities
- ✓ The competition within the local market for leisure and recreation dollars

5.2.4.2 Location & accessibility

The location of the Rwenzori Cable Car at the gateway to the Rwenzori Mountains is already a major tourist hub of Uganda. Together with the Queen Elizabeth Park and the lakes, the Cable Car will serve as the major tourist anchor to this area.

Its location at the fringes of the Rwenzori Mountains will reinforce the synergistic effects of the various activities around the Kasese area. By creating this "critical mass" of activities in this area, we will create a perception of a leisure/recreation destination for tourist and local residents.

The improved access road and parking facilities will accommodate incoming traffic quite efficiently. The tourist hub will also, serve as the main transportation hub. These will conveniently service private vehicles, tour buses, private shuttles (from resort hotels) taxis and public bus system. The approach road to the Lower Station of the cable car will open up accessibility to the Fort Portal-Mpondwe main road for the local population. The figure below shows average hours of travel by road from Kampala to the Rwenzori National park.



5.2.4.3 Market definition

The Primary market available to the Rwenzori Cable Car is defined as those people normally residing within a distance which does not require an overnight stay to visit the Cable Car.

The propensity to visit leisure or tourist attractions normally decreases in inverse proportion to the distance between places of residence and the site. In this respect the resident market has to be segmented into sub-markets according to the distance from the Cable Car.

A key guide in deriving visitor projection for the cable car is the existing visitor numbers to the Queen Elizabeth National Park and Kilembe Mines.

For our purposes, the primary market population has been defined as those people residing in the immediate area of Kasese or within a one hour drive. The nearly 100,000 visitors to the Queen Elizabeth and Rwenzori National Parks together with the visitors to the Kilembe mines will be taken into account as the primary market. The resident population within this area is around 3 Million as it extends up to Kampala in the Central Region and in the south. The secondary market, comprising of areas within a two hour drive and the population within this area is projected at 6 Million.

Therefore the potential resident market will include:

- Primary market (1 hour drive) 2 Million
- Secondary market (2 hour) 3 Million
- Total Market 5 Million

Visitors beyond a 2 hour drive would normally be considered in the tourist category as it would involve an overnight stay.

5.3 Passenger projections for year 1

- The most accurate method of forecasting annual attendance, and the method uniformly adopted within the tourist industry, is by applying market 'penetration' or 'capture' rates to the available resident and tourist markets.
- The penetration rates for "major" tourist attractions from 20 to 40 percent in the primary and 10 to 15 for the secondary resident market. These penetration rates have been achieved in resident market segments with reaches of 0 - 80 km and 80 - 165 km by road respectively
- In estimating likely penetration rates for a tourist attraction in the planning stages the following criteria need to be taken into consideration:

  - Penetration rates decline in proportion to the quality and quantity of competitive leisure/entertainment attraction. This factor is very much in our favor for this project.
  - Penetration rates for the tourist market are a function of the average length of stay and purpose of visit.
  - Uncertainty of the reception of the product by the local market.
  - The demographic characteristics of the markets.
  - The prevailing economic conditions in the market place.
- Recognizing these limiting factors, the subsequent attendance projections for the Cable Car have been based on a best estimate of penetration rates for the first year of operation, with an underlying assumption that a high quality product is created and an effective marketing strategy is implemented.
- A failure to find acceptance in the market place in Year 1 will handicap attendance growth potential in all subsequent years. Likewise, poor acceptance by the local market can seriously affect the penetration of the tourist market due to negative "word of mouth" advertising. However, with the benefit of the experience of other similar cable car installations around the world especially in the tropical regions, it can be concluded that the Rwenzori Cable Car would be a widely attractive tourism product which can pull in the expected crowds.
- The composition of the total available market has been analyzed in terms of residents and tourists. By applying appropriate penetration rates to each market segment it is possible to calculate the projected attendance from each category. The total anticipated attendance can then be compared to the total available market to determine an overall market penetration rate for the park.
- This forecast is based on the assumption that the Cable Car will be a quality, innovative design, be priced realistically and be professionally managed to the standard expected of major tourist attractions.
- Two possible scenarios are projected for passengers during the first year of operations of the cable car which has been assumed to be in year 2020.

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Scenario 1. Best Case 217,000 pax per annum

MARKET SEGMENT	ASSUMED CAPTURE RATE	AVAILABLE MARKET	PROJECTED ATTENDANCE
Primary Market	67	100,000	67,000
Secondary Market	5	1,000,000	50,000
Tertiary Market	2	5,000,000	100,000
		TOTAL	217,000

We have assumed that the cable car will capture two thirds of the present visitors to the Queen Elizabeth National Park and the Kilembe mines for our primary market and just 3% of the resident population of 5,000,000 surrounding the Kasese region and just 0.5%

Scenario 2. Worst Case 130,000 pax per annum

MARKET SEGMENT	ASSUMED CAPTURE RATE	AVAILABLE MARKET	PROJECTED ATTENDANCE
Primary Market	50	100,000	50,000
Secondary Market	3	1,000,000	30,000
Tertiary Market	1	5,000,000	50,000
		TOTAL	130,000

Assumed First Year Visitor Projection: 150,000

REVENUE PROJECTIONS

5.4 PASSENGERS and REVENUE

- In a typical cable car installation, the sources of revenue are not limited to just ticket alone. There are other ancillary sources of income that can augment the total revenue that can be extracted from the facility.
- The ancillary income include rental of shops, sale of food and drinks, sale of merchandise like tea shirts and clothing, souvenirs, trinkets, coin machines and a long list of items that can be introduced at the station buildings.
- This ancillary income normally takes up to about 30 % of the ticket price. For example if a ticket costs 10 dollars, we can expect to generate another 3 dollars in ancillary income giving gross revenue of 13 dollars. The ancillary income can be increased by adding more attractions and income generating facilities like 3 D art museums, kiddie rides, 3 D theatres.
- With the additional of more attractions, the ancillary income can even be increased to double the ticket price income in some cases. In the Langkawi Cable Car experience, the ancillary income has now reached up to the same amount as the ticket price. This means that the visitors are now paying more for other attractions that have been added on to the cable car installation.
- There can also be two tier pricing of tickets with higher prices for foreign tourists and lower prices for local tourists. This pricing strategy is practiced in many parts of the world.
- Two tier pricing consists of different ticket prices for domestic and international visitors. Besides, different pricing, there should also be a daily charge for visiting the National Park
- There also other pricing strategies that can be applied to extract the optimal revenue from each visitor to the cable car. This include group ticket pricing, advance booking pricing and
- For the purposes of this preliminary study, we have worked out various scenarios for passenger revenue and ticket and merchandising income.
- Table 5.1 summarizes the various scenarios for yearly passengers and total revenue
- Table 5.2 shows ticket prices at similar cable car installations at selected tourist destinations around the world.

- Detailed pricing and merchandising income can only be worked out at the project implementation stage.
- The proposed ticket prices for this study will be commensurate with prices of similar installations over the world.

Table 5.1

PROJECTED REVENUE SENARIOS

SCENARIO 1

VISITOR/YEAR	TICKET	ANCILLIARY INCOME	TOTAL	USD
100,000	15	5	20	2,000,000
	20	5	25	2,500,000
	25	8	33	3,300,000

SCENARIO 2

VISITOR/YEAR	TICKET	ANCILLIARY INCOME	TOTAL	USD
150,000	15	5	20	3,000,000
	20	5	25	3,750,000
	25	8	33	4,950,000

SCENARIO 3

VISITOR/YEAR	TICKET	ANCILLIARY INCOME	TOTAL	USD
200,000	15	5	20	4,000,000
	18	5	23	4,600,000
	20	8	28	5,600,000

SCENARIO 4

VISITOR/YEAR	TICKET	ANCILLIARY INCOME	TOTAL	USD
200,000	25	5	30	6,000,000
	25	5	30	6,000,000
	25	8	33	6,600,000

Table 5.2

Rwenzori Cable Car (proposed)	USD 15
Langkawi Cable Car	USD 15
Singapore Cable Car	USD 25
Hong Kong Peak Tram	USD 20
Ngong Ping Cable Car, Hong Kong	USD 25
Skyrail at Kuranda, Cairns, Australia"	USD 40
Blue Mountain, Sydney, Australia	USD 25
Table Mountain, South Africa	USD 20
Ba Na Hills , Vietnam	USD 25

5.5 FINANCIAL CONSIDERATIONS AND IMPACTS

Pending detailed designs on the cable car installation and buildings to determine the actual cost of the project and detailed economic and marketing studies to determine the visitor numbers and total revenue, but based on the feedback received , we can safely derive at the following:

- The estimated construction cost of the project ranges from USD 30 to USD 45 Million
- The estimated annual revenue ranges from USD 2.5 Million to USD 6.0 Million a year.
- The estimated maintenance cost for the cable car system is USD 700,000 a year
- A conservative scenario of USD 35 Million construction cost and USD4.0 Million revenue a year is used in our preliminary study. At this scenario the net income from the cable car operations would be USD 3.3 Million.
- This would give a simple return of around 11% per annum

The projected return of 11% per annum compared to current bank interest rates of 20% makes the project non-viable from a commercial point of view.

However, if we consider the socio and economic impacts and the multiplier effects and benefits of this project to the tourism industry as well as the local economy, this project can be considered for implementation as a government funded project.

As with tourism facilities all over the world, when the destination has all the ingredients of natural beauty, unique flora and fauna, unique geological features, ambient weather and easy accessibility but lacks the requisite amenities and facilities, you build it and they WILL come.

6.00 CONCLUSIONS

The Rwenzori Mountains have been classified as one of the top 10 mountain attractions in the world. The uniqueness of the flora, fauna and geological makeup of the mountains has been researched and the mountains have won accolades around the world. However, access to the Rwenzori Mountains can only be made through long and arduous treks through thick and tough jungle terrain. This has deterred lots of people from coming to the Rwenzori to experience its uniqueness.

- ✓ The building of this cable car will provide easy and controlled access to the showcase of Uganda's rich natural and historical heritage.
- ✓ It is estimated that a cable car system to the Rwenzori Mountains will cost between USD 25 to USD 40 Million depending on the location, length and method of construction.
- ✓ The Rwenzori Cable Car will be the first in East and Central Africa and it will be an iconic attraction as it will be the highest cable car system in Africa. It will be designed not only for tourism but also for highlighting the geological and botanical uniqueness of the Rwenzori Mountains which has been designated a World Heritage Site by UNESCO
- ✓ This preliminary feasibility study has shown that there exists a big potential for the development of a cable car system to the Mountains of Rwenzori and its development should be given top priority as another tourism product for UGANDA.
- ✓ The preliminary site inspections have strongly indicated that the technicalities involved in building a cable car system in an environmentally sensitive area like the Rwenzori Mountains can be achieved with minimal impact on the environment by a team of experienced foreign and local personnel.
- ✓ The multiplier effects of a tourism product like the cable car have been estimated to be about 10 times the turnover of the installation itself. The Government can easily recover its investments via the indirect benefits of the project and the jobs created when the developments are completed.
- ✓ These multiplier effects include the creation of new jobs not only in the cable car installations itself which will need a host of personnel to run, operate and maintain the installation but also in the associated services to cater to the influx of visitors to the cable car. The Project is expected to induce new business ventures, enhance existing business operations and supporting businesses for the increase in visitors

- ✓ It includes the need for additional tour and nature guides, transport operators, lodging and accommodation operators, food and entertainment operators, shops assistants, porters etc.

As the number of visitors increase over the years, the demand for additional facilities to cater for these visitors will also result in new job and business opportunities for the locals.
The development of the Rwenzori Cable Car system will definitely be a game changer in the tourism industry of Uganda and a catalyst to the economic growth engine of Uganda and as such should be implemented as soon as possible. LET'S DO IT!

7.0 THE NEXT STEP

The following are the steps to be taken should approval be given to proceed.

1. Final Decision on Alignment

A final decision must first be made on the location of the alignment, the Kilembe or Mihunga Gates.

2. Detailed Land Survey of the station sites and the selected alignment

- ❖ The Project Team together with a survey team will visit the site selected for the ground stations to determine the suitability of the sites and upon confirmation, the survey team will conduct detailed spot height surveys of the ground for the architects and planners to prepare the detailed master plan.
- ❖ The cable car specialists will then prepare the alignment points for the survey team to survey the location of the towers.
- ❖ The Project Team will have to climb up to the proposed Top Station to determine the ground conditions and suitability of the proposed location and design the Top Station buildings to suit the local conditions.

3. Master Planning and Alignment Study

- ✓ The Architects will prepare a Master plan for the Ground Station to cater for required building facilities of the cable car as well as additional tourism products that can be developed in future phases. These will include the station buildings, car parks, shops, food and drink centers as well as a Rwenzori Forest and Mountain Interpretation Center
- ✓ The Architects will also prepare a Master Plan for the development of facilities up at the Top Station such as walkways, bridges, resting huts and toilet facilities for visitors.
- ✓ The detailed station building plans will also be prepared for the Engineers to design the Civil, Structural, Electro and Mechanical plans of the buildings.
- ✓ A condition for the design of the buildings is that it has to adapt to existing ground and terrain conditions and the construction of the buildings will not involve heavy cutting of the peak.
- ✓ The Cable Car specialist will then visit the locations of the proposed towers together with the Geotechnical and Structural Engineers to confirm suitability of the ground for the towers and to make adjustments on the tower locations depending on the site conditions.

4. Detailed Soil Investigations for Geotechnical and Engineering Study for the Stations and Steel Towers

- Upon the confirmation of the station and tower locations by the Team, a geotechnical and geological survey team will be engaged to carry out soil investigations at the Station buildings and Tower locations.
- The Geotechnical engineer will then study the results of the soil investigations and propose the type of foundation design for the stations and towers.
- The Geotechnical Engineers will also propose soil and slope strengthening measures for the slope if required.
- The Structural engineers will then provide the detailed designs for the buildings and tower foundations as well as any slope stabilization and strengthening measures proposed by the Geotechnical Engineers.

5. Environmental Screening and Monitoring Process

- A team of consultants will also be engaged to prepare an Environmental Screening and Monitoring Plan. (EMP)
- In the preparation of the EMP Report, the Consultants shall undertake to do the following:
- Describe the construction and operation process of the proposed cable car project in Rwenzori, complete with the method statements to be provided by the Consultants
- Conduct site visit, samplings and measurements as required for EMP Report preparation. Samplings will be done for water quality, air quality and noise levels at sensitive areas along the cable car alignment.
- Declare the Client's policy and commitment towards protection of environment for this project. The Report will contain the Client's project organization chart which mentions the name of person in charge of the safety and environment. The Report will also contain Emergency Response Plan (ERP) in case of accidents or natural disaster such as landslide.
- Study and describe the existing environment of the affected areas to cover the physical, biological and social aspects. The physical study amongst others will include the description of the geology, river system of the area and status of water and air quality of the area. The biological study shall consist of identification of species and populations, habitats and communities of the fauna

and flora found in the proposed development area which may be under the impact of the proposed development. The social aspect will look into the existing business and residential most likely to be affected by the proposed project.

- Evaluate and make predictions on the probable beneficial and adverse environmental impact on the environment, which are most likely to arise by the Project, including spin-off development effects, and related activities during the pre-construction, construction and operational period. Special attention will be given to the aspects of soil erosion where the Consultants will review the geotechnical study report from the Client.
- Recommend suitable mitigation measures to reduce the adverse environmental impact to the acceptable minimum level.
- Submit environmental monitoring plans for the duration of the construction period.

6. Detailed Economic and Feasibility and Operational Study

- Upon project commencement, a detailed Economic and feasibility study will be conducted to determine the following:
- Detailed construction costs based on drawings and designs of the buildings, towers, specialist equipment, fittings, electro mechanical works, and all other works associated with the project to give a total development cost for the project
- Determine detailed operation and maintenance costs for the operations of the cable car and all other facilities of the project
- Propose and advise staffing organization and responsibilities for the operation of the cable car
- Work with the cable car manufacturer to draw up operational and maintenance schedules
- Conduct detailed market surveys to determine the accurate visitor numbers
- Propose the ticket pricing and mechanisms
- Propose marketing and promotional activities for the project

CIVIL-COM LTD would be able to conduct a detailed feasibility study and design for the construction of this cable car system and the next step would be for the Authorities to agree as to how the project is to be implemented, either a turnkey design and build concept or via an open tender.

In the event the Authorities should decide to develop the Rwenzori Cable under its own agencies, then **CIVIL-COM LTD** would lead a team of local consultants and contractors that has the benefit of the experience in the construction of Cable Cars to design and build the Rwenzori Cable Car.

CIVIL-COM is confident that the development of a cable car system to Mountains of Rwenzori is a financially and environmentally viable project that would bring a lot of benefits to the economy and the tourism industry of Uganda and would welcome State Approval for the development of the Rwenzori Cable Car project.