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Acronyms

FDI Foreign Direct Investment

BAM Bathing Area Management Model

BARE Bathing Area Registration and Evaluation System

BRALIRWA Brasserie et Limonaderie du Rwanda

CCTV Closed-Circuit Television

DMA Destination Management Area

DRC Democratic Republic of Congo

EAC East African Community

GGGI Global Green Growth Institute

MINICOM Ministry of Commerce

MININFRA Ministry of Infrastructure

NMT Non-Motorized Transport

RDB Rwanda Development Board

REMA Rwanda Environment Management Authority

RTDA Rwanda Transport Development Agency

SWOT Strengths, Weaknesses, Opportunities, and Threats

TDR Transfer of Development Rights







Acknowledgements

Stylos Consult would like to thank all the tourism professionals and stakeholders who gave their time and insights to support the development of this project and whose contributions were key to the completion of this report, *inter alia*, Rwanda Development Board, Rubavu District, Rwanda Environment Management Authority, Rwanda Tourism Chamber, and GIZ Rwanda

The development and drafting of the "Feasibility Study for the Private Management of Rubavu Public Beach and Developing "Avenue de la Cooperation" as a Car Free Beach Promenade" was successfully completed thanks to the dedicated work of a great team of professionals headed by the Managing Director Mr Deodathe Ndazivunye, the Team Leader Lucy Nkuranga and the Urban Planning Expert Dr Jean Pierre Bizimana

A special word of thanks is also dedicated to the Technical Committee under the Chairmanship of Mr Rasmus Westerberg, whose members gave freely of their advice and offered invaluable guidance during the development and formulation of the study







Executive Summary

Rubavu Public Beach is currently under the management of Rubavu District and to improve the state of the beach and the facilities the district is looking for a private partner to invest and manage the beach into a profitable venture. The palm-lined Avenue de la Cooperation next to Rubavu Public Beach is a popular recreational area for locals and visitors to Rubavu and has the potential to be developed and commercialized into an attractive car free pedestrian zone with cafes, shops, and other related tourism services under the profitable management of a private investor. The purpose of this assignment is therefore twofold, firstly it is to carry out comprehensive feasibility studies on both the Rubavu Public Beach and the Avenue de la Cooperation in order to provide factual information on the viability of both ventures and secondly to prepare the management support documentation required to formalize the partnership of Rubavu District and the Private Investor.

Rubavu Public Beach stretches up to 850 meters from the Lake Kivu Serena Hotel up to Gorillas Lake Kivu Hotel with the Avenue de la Cooperation aligning the beach. Rubavu Public Beach is subdivided into 5 different zones with each zone offering a different activity and experience. These zones are the Sports zone that is often used for volley ball matches, Swimming and Boat parking zone, Childrens playground and Events Zone. Currently the zones on the Rubavu Public beach lack adequate facilities, amenities and infrastructure. This unfortunate state of affairs limits the potential of the beach to operate as a profitable venture offering a quality product of international standards. Apart from the lack of facilities other challenges include the inappropriate location of the boat parking area next to the swimming zone which compromises the safety of the swimmers and affect the water quality due to oil spills from the boats, the overgrown algae which can produce toxic or harmful effects, degradation of habitat and shoreline erosion, littering, lack of life guard, watch tower and other safety measures. The conversion of the Rubavu Public Beach facilities and the implementation of a professional beach management system is therefore a key requirement and very vital.

Beach Management System

The well-developed Rubavu Public Beach and the Avenue de la Cooperation will require the implementation of stringent management procedures and systems in order to maintain standards. A key guiding factor in the beach management procedure will be the management of profit making areas and non-profit making areas which provide support infrastructure. To ensure efficiency, it is recommended that the private investor is responsible for the profit making areas while the Rubavu district is responsible for the non-profit making areas which include the maintenance of areas like cleaning the public areas, maintaining "Avenue del a Cooperation" by ensuring it is clean, adequate street lighting, security, green areas, flora beautification, cleaning the toilets and showers on the beach, cleaning the beach public areas and all other non-profit jobs.. The Private investor would be responsible for managing the more sensitive profit making areas like hiring out activities on the zones, running the shops and restaurants, paid car park and all others. A management contract would be signed between the Private Investor and Rubavu District with details on each responsibility an appropriate lease period for the private investor and payment of monthly rent to the district over the age of the lease period.

For the management of the beach profit areas, the Private Investor will require an effective Beach Management model that is able to ensure quality service and international standards are maintained. The management system must be internationally recognized and able to upgrade the status of the Beach to international standards. To ensure standards are maintained there must be some accountability procedures to ensure maintenance. The beach management system should be able to monitor and mitigate on any challenges or threats faced including the availability of adequate facilities in sound condition, water quality for the swimmers, pollution, litter management, maintenance of







washroom facilities, ease of beach access, security on the beach, damage to the eco system. The recommended management System to be implemented is the internationally recognized Blue Flag Beach Management system which can effectively cover all areas of concern.

Proposed Development of Rubavu Public Beach

To upgrade the Rubavu Public Beach the following developments are proposed

Area Proposed Development		Expected Experience	
Sports Zone	 Seating Facilities and court Washrooms, Wheel Chair Access Green Pathways 	A zone offering modern facilities to have exciting outdoor sports on the beach.	
Swimming	 Watch Tower & Diving Board Water Slide Wheel chair access to beach Changing Rooms / Washrooms Chairs Tables and Umbrellas Childrens games and Equipment including climbing castles, slides, and swings Toilets and Changing Rooms 	Swimming experience in a safe environment that is well managed and equipped with the comfort of the visitors in mind An environment catering for children of all ages in a safe area.	
 Removal of concrete structures Control rainwater drainage 			
Events	ToiletsTent and Seating FacilitiesLighting and signage	A zone offering modern event space in on the beautiful beach with the Lake Kivu as the calm background	
Boat Parking	Parking, Dock	Visitors will access the boats in a space that is easily accessible, safe and clean	







Proposed Development on Avenue de la Cooperation

To develop and convert the Avenue de la Cooperation into an attractive commercialized pedestrian zone with cafes, shops, and other related tourism services the following investments are proposed.

Area	Proposed Development		
Avenue de la Cooperation	Construction of 5 Shops		
	Car Park		
	Visitor Center		

Other key developments will include widening of the road, building an access road with modern covered bus stops, Bicycles for hire, lighting and development of a green infrastructure

Plan of Investment and Investment Costs

It is proposed that the construction of different zones on the beach will be taken up by an investor who will provide private capital to develop the investments. The Rubavu District will make the project attractive to investors by ensuring an enabling environment and providing the investor with a lease for an appropriate number of years to recoup the capital invested. The investor will pay rent to the district for the period of the lease. Details of the lease and the application process will be provided in the Terms of Reference document and the Management contract to be signed between the Investor and the Rubavu District. Apart from developing the projects, the investor will provide several benefits to the Rubavu District including (i) Participating in Community Social Responsibility activities like landscaping and beautification around their premises, regular cleanup drives of the Rubavu Public Beach and the Avenue dela Cooperation, (iii) Providing employment opportunities for the local community (iii) Paying taxes to the Government.

Details of the investment costs in each zone are as below

Section	Number	Unit Cost Rwf	Total Cost Rwf	Total Cost USD
Sports Area	1	252,700,845	252,700,845	247,568
Boat Parking Area	1	471,221,258	471,221,258	461,651
Swimming Area	1	199,634,871	199,634,871	195,580
Kids Park	1	94,739,516	94,739,516	92,815
Events Area	1	603,753,937	603,753,937	591,492
Main Public Parking	1	263,062,240	263,062,240	257,719
Visitor Center	1	19,183,739	19,183,739	18,794
Shop	5	14,098,142	70,490,710	69,059
Total Construction Cost			1,974,787,116	1,934,679

The total cost of construction is Rwf 1,974,787,116 or 1,034,679 United States dollars

Total cost of Investment

The total cost of the whole investment is as below

Item	Rwf	USD
Total Construction Cost	1,974,787,116	1,934,679
Pre Opening Costs 10% Total construction cost	197478711.6	193,468
Working Capital 10% of total Construction	197478711.6	193,468
Total Cost of Investment	2,369,744,539	2,321,615







Sources of Income to private Investor and Rubavu District

Entrance to the Rubavu Public Beach will be free of charge for all visitors, however the private investor will charge visitors for the services provided. Each zone will be offering a different activity, service and attraction. Below are suggested pricing the private investor will charge based on prices charged for similar products in Rwanda, regionally and internationally. As mentioned above, the private investor will sign a lease with the Rubavu district and pay rental fees at an amount to be agreed upon in the management contract.

Below are the proposed prices to be charged by the private investor

	zeron are the proposed prices to be enabled by the private investor					
		PRICE PER UNIT RWF	QUANTITY			
1.	EVENT ZONE (hired out)	1,500,000	1Day			
2.	SPORTS ZONE (hired Out)	1,500,000	1 Day			
3.	KIDS PARK	10,000	Per Child per day			
4.	SWIMMING ZONE	10,000	Per Person			
5.	SHOPS (Hired out)	700,000	Per month			
6.	CAR PARK – VISITOR CENTER Hired Out	700,000	Per Month			

Projected Sales

Below is a summary of the profit and loss projections over a 5 year period

	SUMMARY OF RUBAVU PUBLIC BEACH 5 YEARS FINANCIAL PROJECTIONS					
Sales in RWF	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL RWF
Gross sales	860,400,000	929,000,000	925,600,000	937,440,000	932,960,000	4,585,400,000
Total Operating Expenses	107,347,200	112,651,941	112,920,309	113,832,760	113,188,677	559,940,886
Total Non Operating expenses	18,000,000	18,000,000	18,000,000	18,000,000	18,000,000	90,000,000
Total expenses	125,347,200	130,651,941	130,920,309	131,832,760	131,188,677	649,940,886
Profit before tax	735,052,800	798,348,059	794,679,691	805,607,240	801,771,323	3,935,459,114
Tax 30%	220,515,840	239,504,418	238,403,907	241,682,172	240,531,397	1,180,637,733
Profit after tax	514,536,960	558,843,642	556,275,784	563,925,068	561,239,926	2,754,821,380







INTRODUCTION

1.1. Background

Tourism is one of the sectors prioritized by the government of Rwanda to accelerate economic growth by stimulating a vibrant and competitive environment that promotes the social, economic and environmental sustainable development growth pillars. The implementation of sustainable development, efficient marketing strategies and strong public-private partnerships continues to attract investment in the tourism sector through Foreign Direct Investment (FDI), Public Private Partnerships (PPP) and Private Investment. Overall the strategy aims to raise adequate sustainable revenue that contributes to the conservation of the natural environment, creates employment opportunities at different levels and contributes to the empowerment of the local community. In the last 6 years from 2015 to 2020 tourism arrival numbers to Rwanda have steadily increased from a total number of 1,298,552 in the year 2015 to a peak of 1,711,459 in the year 2018 and 1,633,383 in the year 2019 Tourism Arrivals to Rwanda by Region 2015 to 2020.

Table 1: Tourism Arrivals to Rwanda by Region from 2015 to 2020

Region	Year 2015	Year 2016	Year 2017	Year 2018	Year 2019	Year 2020
Asia	52,000	41,199	40,133	47,953	49,645	14,276
DRC	317,610	473,409	666,857	744,767	762,305	180,616
EAC	677,756	625,266	611,212	678,595	582,487	181,426
Europe	69,730	79,894	75,297	77,767	85,152	28,081
Nationals	100,816	57,295	76,824	46,864	28,717	15,151
North America	35,760	47,402	40,274	46,925	49,790	12,704
Rest Africa	31,714	40,460	44,773	57,186	64,319	62,862
Rest World	13,166	12,367	14,052	11,402	10,968	2,200
Tota;s	1,298,552	1,377,292	1,569,422	1,711,459	1,633,383	497,316

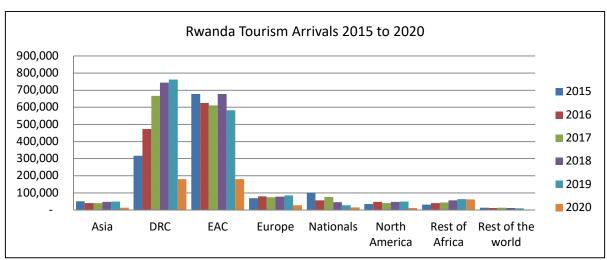


Figure 1: Rwanda Tourism Arrivals 2015 to 2020

The impresive growth in tourism numbers has been achieved due to the aggressive promotional and marketing campaignes and strategies all focussed on promoting the country. However the tourism numbers dropped significantly in 2020 due to the COVID 19 pandemic. Nevertheless as Rwanda continues to control and manage the pandemic, it is believed that the numbers will increase as the







world continues. Rwanda Development Board is also implementing various tourism growth strategies including targeting new markets like the Israel market and the African American market, promotion of sports tourism, development of a hospitality training institute in order to ensure high quality services in the sector and the introduction of new products into the sector like hot air balloons, luxury floating hotel on Lake Kivu and the opening up of Gishwati National Park. It is therefore evident that the diversification of the tourism product has been the key approach with less focus on the Gorilla as the main tourism attraction.

The "Rwanda Sustainable Tourism Development Plan" presents different Destination Management Areas (DMAs) in an effort to diversify the tourism experience through the creation of new core products in each destination. These DMA include Kigali Hub, Volcanoes National Park, Nyungwe National Park, Akagera National Park, Karongi, Rubavu, and Muhazi. The Destination Management Area of this project is Rubavu district and the surrounding Kivu belt which in the last 5 years has been made more accessible due to improvement to the infrastructure.

1.2. Purpose

Rubavu Public Beach is currently under the management of Rubavu District and to improve the state of the beach and the facilities the district is looking for a private partner to invest and manage the beach into a profitable venture. The palm-lined Avenue de la Cooperation next to Rubavu Public Beach is a popular recreational area for locals and visitors to Rubavu and has the potential to be developed and commercialized into an attractive car free pedestrian zone with cafes, shops, and other related tourism services under the profitable management of a private investor. The purpose of this assignment is therefore twofold, firstly it is to carry out comprehensive feasibility studies on both the Rubavu Public Beach and the Avenue de la Cooperation in order to provide factual information on the viability of both ventures and secondly to prepare the management support documentation required to formalize the partnership of Rubavu District and the Private Investor.

1.3. Justification

The decision to convert the management of Rubavu Public Beach from Public Sector management by the Rubavu District to Private sector management by a private investor and to commercialize Avenue de la Cooperation into a car free pedestrians road is justified for the following reasons:

- The diversification of the tourism product in line with the tourism development policies in Rwanda
- The need for the development of new tourism products of international standards that are able to attract the domestic, regional and international market and support the diversification policies
- The ideal location of Rubavu one hour away from Volcanoes National Park and can be visited enroute to Volcanoes National Park, for weekend getaways and for visitors from the DRC Products and services of international standard are therefore required
- To support the growing tourism numbers, there is the need to upgrade, improve and manage the current infrastructure and amenities both on the beach and Avenue de la Cooperation
- Currently, the Rubavu district budgetary allocation is not able to fund the upgrading of the Rubavu Public Beach and Avenue de la Cooperation. A private investor is therefore required to inject private capital into the project thus reducing the demand for resources by the Rubavu District
- The private management of the Rubavu Public Beach will be a source of additional income to the district







• The well qualified and experienced private manager will ensure the quality management of the facilities and provision of quality service.

1.4. The Assignment

In March 2021 the consulting firm Stylos Consult submitted their bid and were awarded the contract to develop a "Feasibility Study for the Private Management of Rubavu Public Beach" The client of the project is Rubavu District and the Rwanda Development Board. The assignment officially commenced in April 2021 with the setting up of the Technical Committee and the first meeting where there was an elaboration of the scope of duties and presentation of members. . In the course of the study the technical committee held regular meetings with the consultants to ensure compliance to the Terms of Reference. Table 2 shows the members of the Technical Committee

Table 2: Members of the Technical Committee

Tubic 2.	Table 2. Weitbers of the recinical committee				
1.	Mr Rasmus Westerberg	Chairman of Technical Committee GIZ			
2.	Mr Emmanuel Mwiseneza	Rubavu District			
3.	Mr Ildephonse Kambogo	Rwanda Development Board			
4.	Mr Jackson Hakiza	Rwanda Development Board			
5.	Mr Henry Mugweri	Rwanda Tourism Chamber			
6.	Mr Deodathe Ndazivunye	Stylos Consult – Managing Director			
7.	Mrs Lucy Nkuranga	Stylos Consult – Lead Consultant			
8.	Dr Jean Pierre Bizimana	Stylos Consult – Urban Planning Expert			
9.	Mr Olivier Kanyabikali	Stylos Consult – Tourism Expert			
10.	Mrs Noella Ishimwe	Stylos Consult – Consultant - Operations			

1.5. Objectives

The overarching objective of the assignment was to increase the attractiveness of Rubavu Public Beach as a tourist destination by developing a comprehensive feasibility study on the private management of Rubavu Public Beach and pedestrianizing the Avenue de la Cooperation into a car free zone offering various tourism activities and products.

Specific objectives are to:

- Conduct feasibility studies for Rubavu Public Beach and Avenue de la Cooperation
- Develop Financial Projections to advice on profitability of the privately managed beach and Avenue de la Cooperation
- Advise on sound environmental procedures which will protect the Lake Kivu and its environs by conducting physical and environmental survey of the Rubavu Public Beach
- Engage various stakeholders on this project for a better buy-in and successful implementation process
- Develop terms of reference for the procurement of Rubavu Public Beach
- Draft a management agreement for the private management of Rubavu Public Beach

1.6. Deliverables

The assignment includes the following deliverables

- Inception Report outlining the framework, plan and roadmap for the assignment
- Feasibility study for Rubavu Public Beach
- Feasibility Study for Avenue de la Cooperation
- Collection of stakeholder input
- At least three stakeholder workshops as well as individual consultations with key stakeholders.
- Terms of Reference for Tender of Private Management of Rubavu Public Beach
- Management Contract







1.7. Methodology

1.7.1. Literature Review

To ensure all the above objectives were well covered in an efficient manner we did an extensive research of secondary data including the policy documents and studies done. Key attention was given to the policies that had already been approved and in the process of implementation and we made sure our objectives were well aligned to existing policies. The secondary data was obtained from the various documents and studies conducted by the government and other organizations such as Rwanda Development Board, Rwanda Environment and Management Authority. Documents reviewed were: Tourism Master Plan For Rwanda; Revised Sustainable Tourism Master plan; Guidance Rational Management Lakeshores Towards Sustainable Development Rwanda; Rubavu Beach Management Plan; Rubavu Infrastructure and Transportation; Rubavu Master Plan vi) Rubavu Zoning Regulations; and RDB Annual Reports.

1.7.2. Stakeholder Workshop

Meetings and discussions were held with stakeholders who provided more information in their fields of expertise. An online stakeholder's workshop was held on 27th July 2021 to discuss and deliberate on the draft Inception Report which had been circulated to stakeholders. We received important and relevant inputs during this workshop and incorporate the information in the draft Inception Report and successfully developed the Final Inception Report which was endorsed by stakeholders.

1.7.3. One to One Interviews

Field visits were made to Rubavu and one to one interviews and discussions were held with stakeholders. We made use of questioners to ensure all relevant fields are covered and visited each stakeholder for interviews of vital importance were the stakeholders surrounding the Rubavu Public Beach as they would be directly affected by any development on the beach area. We therefore met with senior officials from Kivu Serena, Hillview Hotel and Gorilla Hotel. We also held meetings with key tour operators in Rubavu, who presented their views on the needs of the tourist and required changes needed to make the beach more attractive to a wider selection of clients. Below are photos showing various stakeholder interviews held in Rubavu City.



Hillview Hotel Manager Interview



Gorilla Hotel Interview with Manager

Apart from the stakeholders from the surrounding community to the Rubavu Beach, we held meetings with the local community micro business people who relied on the beach for their business activities. This mainly included the boat operators, photographers and curio sellers. From this group we receive a wealth of information on the requirements and changes needed to improve on the mangement of the beach and the smooth conducting of business ventures.









Discussions were also held with officials from Rwanda Tourism Chamber, One Stop Center in Rubavu and the Rubavu District.







2. OVERVIEW OF RUBAVU SECONDARY CITY

2.1. Historical Background

Rubavu was founded in 1907 by the Germans as a military outpost with the aim to control the western borders from any potential attack from the DRC which was then ruled by Belgium (Sirven and Prioul 1981). Since 1911, commerce and defense were the main functions of the Rubavu City. Commerce was in the hands of Greeks, Arabs and Indian-Pakistanis. Since its creation, Rubavu was seen as a tourist city because of its location near the Lake Kivu and its proximity to the Volcanoes National Park. During the 40 years of colonization, Belgians considered Rubavu as a suburb of Goma Town and a preferred destination of Belgian colonizers of Kivu Province (Muhimpundu 2006). Rubavu city has many attraction sites for tourism. These include for example Nyamyumba hot springs which is located at 9 km distance from Gisenyi town center the road to Kigali. The 1918 First World War graves, known as a burial place for Belgian soldiers who died fighting against the Germans. This one is located at 2 km from the town centre of Rubavu, along the main Kigali-Rubavu Road. There are also a Genocide memorial and cemeteries such as Mbugangari and Muslim cemetery along the "Petite Barriere" Road. Since its creation, Rubavu City was appreciated by the visitors for its "Riviera" atmosphere and cool climate as undeniable assets for tourism development. This City has experienced a significant physical development in recent years in particular and specifically since 1995 with the massive return of former refugees from Congo who settled there in great numbers (MININFRA 2011). The focus area of this feasibility study is an attractive colonial port located at the north end of Lake Kivu. To kick start the regeneration of the area, improvements to the public realm are required to this historic urban area in decline. Based on the Sustainable Tourism Development Master Plan for Rwanda, the Rubavu destination management area will initially focus on the beach area of Cooperation Street which is popular with both the local domestic market and visitors from the Democratic Republic of the Congo (UNWTO 2009).

2.2. Access and Infrastructure

The new Rubavu Infrastructure Master Plan has developed the transport vision for Rubavu that will take into consideration the National Transport Vision. The vision for Rubavu 2050 is to have a unique identify as a "Cross border Trade & Tourism Gateway of Rwanda (RHA and GGGI 2019). Rubavu City Branding Strategy is a plan that encompasses specific, long-term objectives that can be achieved with the evolution of a successful brand of "The Best City of Trade and Leisure", the two combined components of Rubavu Secondary City's character that make it identifiable (Rubavu District 2019). This will be further enhanced to be a vibrant and happy city for all its citizens. This strategic vision of transport has set a strategic goal to achieve Improved Connectivity and integrated logistics of the city. This will be to embark on the green transport solutions, such as bicycling and walking, which is already prevalent in the city of Rubavu. Moreover, it is envisaged to integrate the Non-Motorized Transport (NMT) into the public transport system, including port and air transport, through the last and first mile principle. Furthermore, it is envisaged to optimize the trade and logistics potential of the city as the gateway city to and from the DRC.

There is an existing public transport network in Rubavu. This network comprises of mini-buses, medium buses, motorbikes, bicycles and buses. However, with the expansion and redevelopment of the city, a revised network will need to be investigated and developed. As public transport in the western region is growing in demand, the services need to become more efficient and more accessible. However, with the lack of all-weather roads in the region and in Rubavu, this creates an initial costly investment to ensure a reliable, cost effective and accessible service. The Public Transport Policy and strategy for Rwanda 2012, indicated that the fundamental principles of public transport services should ensure universal public transport services for all citizens taking into account the accessibility, mobility (door to door),







availability for use(responsive to demand), reliability to use (providing services as per standard time schedule or available on demand); safety and security, monitored and evaluated level of service and performance, satisfaction from the user's point of view (targeted user groups).

In the national context, as per transport vision Kigali, Musanze and Rubavu are proposed to be connected by railway in future. The extension of the planned railway also passes through the northern border of Muhanga, providing some potential to optimize on this rail link. In addition to the rail proposal in the transport vision, the primary freight route will be connected along roads for Rubavu between Rubavu-Muhanga-Kigali, leading therefore to the key freight connectivity from the transport vision for Rubavu City. The public transport network for Rubavu will strengthen the freight network, weighbridges, truck stops and roadside stations, and the planned railway network extension connecting Rubavu to DRC. It will also improve water transport through development of harbor facilities along Kivu lakeshore at Karongi, Rubavu and Rusizi ports, and as well as the water transport connectivity along the Kivu Lake shore. This public transport will also results in well-maintained truck route condition, upgraded roads, and well-developed interior hierarchy roads network while promoting shared spaces between big and small freight on bicycles. Finally, it is also worthy to mention that Rubavu Secondary City has also small airport which, although not currently being used, is completely functional. This equipment is an asset for the town and its development. Besides, the runway is to be extended to allow the landing of heavy porters. Air access will be improved by rehabilitation of existing airstrips in Rubavu.

2.3. Geographical location

The Rubavu City lies 60 km to the west of Musanze and the Volcanos National Park, and 110 km north of Karongi. It is a 160 km journey to Kigali on good roads. From the Volcano National Park, it takes about one and half hours by car via Musanze —Rubavu is 69 km by distance. Gisenyi Beach is adjacent to the Goma city of DRC. It takes five minutes through the Independence Road from the border between Rwanda and DRC and its only 1.7 kilometers. Gisenyi's lakefront spans of shoreline, sand beach, swimming site etc.

The City of Rubavu is well positioned as a tourism destination, due to the fact that the large Congolese city of Goma is located close by, where many tourists originate from. Moreover, Rubavu positions itself as a hub for Gorilla tourism, mainly for international visitors (MINICOM 2013). By sharing border with Goma of the Democratic Republic of the Congo (DRC), this facilitates a vibrant cross-border trade providing a livelihood for many Rwandese and Congolese and thus contributing to economic growth of both two cities. This cross-border movement and business have made Rubavu as the most developed city in Western Province (REMA 2017). Figure 2 illustrates the strategic potion of Rubavu City on Kivu Lake.









Figure 2: Strategic of Rubavu City on Kivu Lake

Being located along Lake Kivu, Rubavu occupies a strategic location for national and international travelling. It enjoys a proximity to the large human population in Goma and is also close to the Volcanoes National Park and the strong tourism that occurs in that region (REMA 2020). Lake Kivu waterfront tourism zone offers tremendous potentials for Rubavu City to establish itself as the cross-border trade and tourism gateway of Rwanda. Recognizing this importance, the Integrated Kivu belt Tourism Master Plan aims to leverage on the existing tourism potential of Lake Kivu and to provide tourism facilities along the Kivu lake waterfront (MINICOM 2013).

2.4. Environmental setting

2.4.1. Topography and Hydrology

Rubavu city is located in the shadow of the active volcano of Nyiragonga, which erupted in 1977, 2002, and very recently in May 2021. So far, it has been safe from any lava flows from these volcanic eruptions. The urbanized area of Rubavu City presents two main relief categories: a plain area adjacent to Kivu lakeshore in the south of the city, and a mountainous area in the north east and South East of the City. The north-western part of Rubavu District has rich volcanic soils formed from the decomposition of lava, but they are shallow. The portion of Rubavu City towards the northeastern part of Lake Kivu is flat area but which was safe from past eruptions (MININFRA 2016). The hilly areas with more than 15 percent slope such as the Mount Rubavu are highly fragile, easily erodible and susceptible to landslides and therefore unsuitable for building. The lowest elevation on lakeshore is 1,775 meters while the highest elevation is around 1,922 meters on Rubavu Mount in North-East. Due to volcanic landscapes, this lake few hydrological network of tributaries. Rubavu City is crossed in the South by the river Sebeya which originates from Gishwati-Mukura National Park. This stream crosses several minibasin slopes subjected to the erosion before throwing itself into the Lake Kivu. Thus, at the exit, the river's waters are strongly loaded with sediments. The configuration of Sebeya River network and the natural uneven variation have allowed the installation of hydroelectric power plants. At Sebeya outlet, nutrients load and high turbidity reduce significantly the aesthetic quality of Lake Kivu, having a harmful impact on recreation and tourism, aquatic life and affect the livelihoods of people living in the vicinity.







Assessing the sediment load fluctuations in Sebeya river is useful for water managers and planners to adjust operations accordingly (Majoro et al. 2020). Figure 3 shows the topography and hydrology within Rubavu Secondary City.

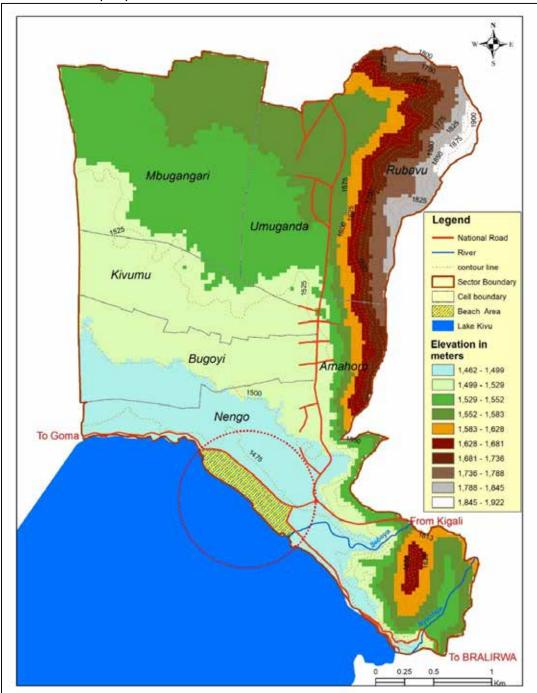


Figure 3: Topography and hydrology within Rubavu City

The steep slopes in the eastern part are coupled with high rainfall intensity lead to soil erosion which can be seen in the color of the Sebeya River's waters as it enters the Lake Kivu near the Lake Kivu Serena Hotel. The temperature within the urban area ranges between 15-25°C. The main annual rainfall is 1200







mm with March, April, and October receiving the highest rainfall. Lake Kivu plays an important economic and ecological role. This lake constitutes a tourist attraction for Rubavu City due to its beach and scenery, water sport such as swimming, kayaking and motor boat sport. It also provides electricity to national grid through the use of methane gas. In terms of biodiversity the lake provide habitat to fish (Ndagara species) which are of nutritional importance.

2.4.2. Geology of Rubavu City

Rubavu town is implanted in a zone characterized by four lithologic zones: rocks (and of ashes) volcanic zone which extends on the major part of Gisenyi, Rubavu and Rugerero sectors (zones of plains); granitic zone which covers the mountain range established by the Mount Rubavu which straddles the three aforesaid sectors; granitic and metasedimentary zone mainly encompassing the Southwest part of Rugerero sector and the major part of Nyamyumba sector; and alluviums zone located in the center of the massif of the Mount Rubavu, straddling the border between Rugerero and Nyamyumba sectors, and in the valley situated near the brewery of BRALIRWA. Being located near the volcano Nyiragongo, Rubavu City is exposed to potential risks linked to the volcanic activity and earthquake of the region, which is however closely followed by the authorities and the civil safety department in order to be able to secure the population in case of serious threat.

The hazard map indicates that the probability that lava flows is greatest in the areas of Goma that was largely devastated by the 1977, 2002 and 2021 lava flow (Pouclet and Bram 2021). While the City of Rubavu which was not reached by lava flows in 2002 and 2021, this city is however characterized by intermediate to high hazard due to its proximity to the fracture alignment with highest probability of future venting (Favalli et al. 2009). Based on the past experience of May 2021, a strong seismic activity, associated with fracturing events after eruption created building damage in Goma and Rubavu cities. The high levels in days following the eruption seismicity with earthquake shocks has also been felt more than 100 km away (Pouclet and Bram 2021). Such an intense post-eruptive seismic activity and ground fracturing, together with ground subsidence detected in Rubavu and along the shore of Lake Kivu, provide evidence that the 2021 Nyiragongo eruption have most likely been triggered by a major rifting of tectonic origin which is still ongoing. These telluric phenomena and the volcanic eruption raised concern about a potential lethal gas burst from nearby Lake Kivu that is known to contain an immense amount of carbon dioxide and methane dissolved in its deep water layers. A major disturbance to the stratification of the lake water could lead to an overturning and a catastrophic, deadly release of the gases. Such a disturbance might be provoked by earthquakes beneath the lake, lava flows entering the lake from above, or fracturing and eruption occurring beneath the lake - a risk that needs to be seriously evaluated (Allard et al. 2002).

2.4.3. Current Land Use

The immediate stretch along city centre has been zoned to allow commercial activities, but the shoreline extends up to the southern edge of Rubavu City. These scenic lakefront areas are identified as tourism promotion zones that would encourage tourist-oriented retail and commercial uses. Although tourism is a significant part of Rubavu's economy with many lake view hotels and opportunities to access the Congo-Nile Road by bicycle or car, it remains underexploited (Government of Rwanda and GGGI 2015). Figure 4 shows the existing land use map of Rubavu Secondary City.







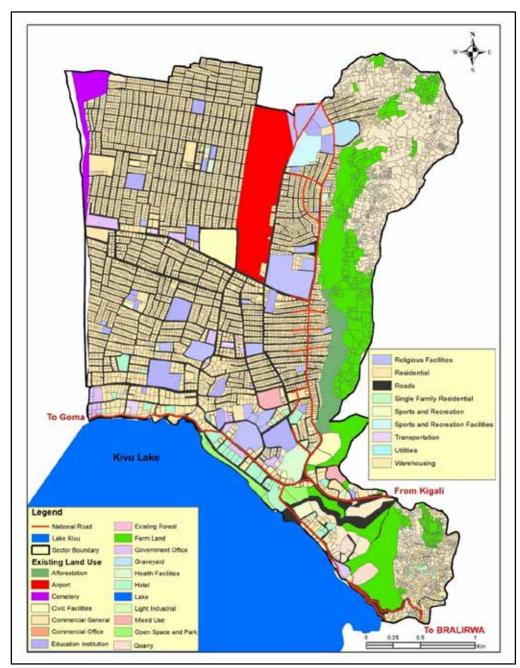


Figure 4: Existing land use map of Rubavu City

Some urbanized area of Rubavu City is set on a sandy beach lined with swaying palms, modern and colonial-era hotels that exude an atmosphere of tropical languor. The northern shore of the Kivu Lake on which Rubavu lie, is a flat plain featuring lava formation from the eruptions of nearby Nyiragonga Volcano. In contrast to Goma, Rubavu City escaped the lava flows of both the 1977, 2002, and the 2021 volcanic eruptions, which destroyed between 15% and 40% of Goma. The centre of Rubavu City lies in the foothills at the northeast corner of the lake, and low-density expansion is taking place in the hills, which are expected to be safe from future eruptions. There are no natural forest in Rubavu Secondary City. However, the re-vegetation of Mount Rubavu by native species has provided a good scenery and refuge for birds and reptile. Rubavu city is also a strategic location regarding national and international







travels in terms of Rubavu airstrip, operational lake transport, and renewed transport infrastructures including urban road networks.

Currently, the City of Rubavu must face several development challenges. It must prepare its development taking into account various factors such as high demand in terms of basic infrastructure and services of an increasing population; physical and natural constraints (Lake Kivu in the South-West, Mont Rubavu in the East); need to accommodate the surplus of rural population migrating towards urban centers and its integration into urban environment (housing, infrastructure, services and employment), promotion of economic development through the tourism activities, and protection of the surrounding environmentally sensitive areas (nature, lake water, vegetation, etc) as one of the prerequisites to achieved the tourism development (MININFRA 2011).







3. CURRENT CONDITION OF RUBAVU PUBLIC BEACH

Before any intervention can be put in place, it is vital that there is full understanding of the current status of the beach with emphasis on all the underlying issues that may not be very obvious. According to information provided in the Rubavu Beach Management Plan, this beach stretches up to 850 meters from the Lake Kivu Serena Hotel to the northwest. Although the sand at the beach is generally clean, its color is considered as dark yellow due to aquatic plants deposits and small volcanic black stones on the beach.

3.1. Tradition of Rubavu Public Beach

Brief History of Gisenyi Beach; Beach Legends Events, Story of Beach Community, Establishing any Missions or Functions? Nestled in Rwanda's north, it is one of the country's most popular tourist destinations. It is home to spectacular scenery, some of the best hotels in the country and Lake Kivu as the main attraction of this idyllic lakeside resort town that tens of thousands of visitors flock to every year.

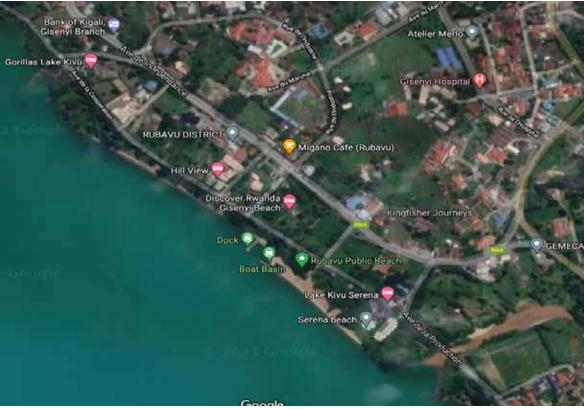


Figure 5: Rubavu Beach Area from Google Map

The beautiful and pristine Rubavu beach is a paradise complete with Mangrove trees, hotels, resorts and community campsites around Lake Kivu. The beach is suitable for swimming, beach soccer and volleyball, boat rides and sun bathing, or even taking a long stroll along the beach front. Situated in Rubavu City, this beach is managed District of Ruby local authority of Rubavu. Rubavu Beach is therefore a public area used for swimming, small maritime transport. A big area this area used for events and so many people from different corners comes to enjoy there. Hotels and restaurants are dotted along the lakeshore, from budget motels to luxury resorts.







3.2. Beach Location and Accessibility

The study site is located in Rubavu Sector in Ndego Cell which is adjacent to Kivu lakeshore. Rubavu Public Beach stretches up to 850 meter from the Lake Kivu Serena Hotel to North West up to Gorillas Lake Kivu Hotel. Many hotels are located in surroundings of Kivu Beach such as Gorilla Lake Kivu, Hill View, Lake Kivu Serena, Western Mountain Hotel, Discover Rwanda Gisenyi Beach, Hotel Palm Beach, Planette Motel...etc. The Public Beach and Beach Park range from 40 meters to 90 meters from the water to the fence of road junction of Avenue de la Revolution. Currently, Rubavu Public Beach has been zoned into different sections with different activities taking place in each zone. According to Rubavu Beach management Plan (Jeong 2018), the Rubavu Beach is composed of four parts including entries such as beach visitors' centre, a public beach parking lot, and beach park and beach sand. However the District of Rubavu has initiated the new pilot project and divided the Kivu Beach area and the beach park into five zones.

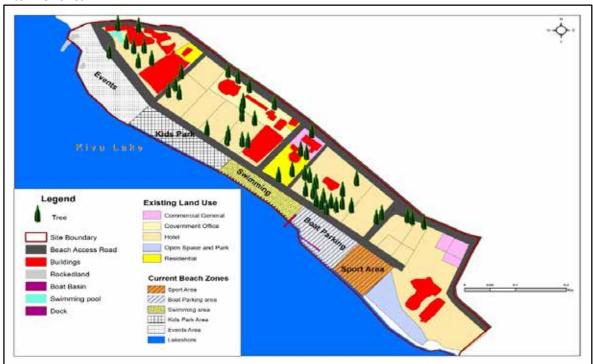


Figure 6: Current Land use and zoning around Rubavu Beach

This tourism development zone in Rubavu City is situated in the strategic waterfront area. It is further sub zoned into different zone including residential and hotel zone with a purpose of creating a high-end mix single use area, hotel and recreational zone to create an attractive and vibrant touristic and recreational district; service and residential zone to create mixed development district with a variety of services (administration, banks, cultural facilities) and residential (single and high standing apartments buildings) The adjacent areas to the cooperation street include Rubavu Public beach and an area zoned for tourism, recreation and commercial activities with some public offices and few residential building. Currently, a big part of this area present some undeveloped land which are vacant for future development. Four hotels namely Gorilla Hotel, Hill View Hotel, Discover Rwanda Gisenyi Beach, and Serena Kivu Hotel are located in this zone. Another new hotel is under construction.

The total area of the operational beach is estimated to 48232 m². The table below shows the different zones of the Rubavu public beach and their respective area







Table 3: Zones of the Rubavu Public Beach

Zones	Area (m²)
Sport Area	7317.24
Boat Parking area	9155.92
Swimming area	6602.25
Kids Park Area	9977.85
Events Area	15178.79
Total	48232.06

3.3. Description of the Beach Zones

3.3.1. Sports Area

It is near Serena Hotel, reserved for sport and would offer facilities for sport. The District of Rubavu, an organization or company will bring beach sports like beach volleyball, sand soccer, handball, rugby and other sand-friendly activities to this zone. The District of Rubavu has proposed the good location for beach activities, and is willing to partner with any organization to bring the sport and recreational establishments to this sand beach area. The clean and well-managed sand beach to be developed will provide players with the opportunity to enjoy beach volleyball, soccer and football. The sports area has in the paste hosted international volley ball competitions. However the area is in a bad condition and requires upgrading and repair in order to acquire international status. The utilities electricity and water are available on the site however, major challenges are inadequate sitting area for spectators (old





benches that are in very poor condition and can break at any time).

This is area lacks the washrooms, toilet and changing facilities for guests and players and dustbins for litter. However, there is a need to make sure that the provided space area for spectators is sufficient. As showed in Table 3, the total area covered by the sport zone represent 15.17% of the beach area which is equivalent 7,317.24 m².

3.3.2. Boat Parking

This zone is subdivided into two areas. One is the place for mooring boats. This area should be well maintained to provide convenience to visitors from different areas to enjoy boating on the Kivu Lake. This boat basin has lost its function due to sand runoff around the entrance, spoiling the beauty of the Gisenyi beach. It has become the big obstacle to the beach users. The first thing the District should do is







to smooth the way with restoration work. As neglecting water circulation, leaving this situation as it is, it brought about the result in water contamination and additional water pollution. Sand dredging work is the urgent business and the authority should take appropriate measures getting the freshwater to be circulated, reinforcement work is needed as soon as possible. The District has prepared for an appropriate countermeasure, and removing sand in the boats parking area to prevent stagnant water and we have completed this task. Recreational activities have a huge impact, careless boating has substantially damaged contaminated beach water in many parts of the world. The increased popularity of boating has also adversely affected the beach environment. These floating materials are a major source of beach pollution through the dumping of garbage and untreated sewage at lake, and the release of other shipping-related pollutants. The below Picture shows the Boat Parking.



Figure 7: Boat Parking and Water Sport Activities Zone

The other issue is the part for water sport activities, reserved for swimming with coaches who instruct the swimmers how to swim safely.









Figure 8: Current status of the docking area

Gisenyi public beach has been sharing the dock constructed with concrete and iron materials in the middle part of the beach. Most importantly, the District should decide at an early stage how to handle the issue, followed by detailed planning and implementation after showing the Rubavu District's position and view on the parallel use, managing them mixed together, and stating that whether boat ramp access, approaching ships, would be controlled (regulated) or allowed to park on the central area of the Rubavu Public Beach. Boating on Kivu Lake presents many opportunities for fun and relaxation, but also poses the biggest threat for the potential safety issues including collisions between swimmers and boats. Also there may be pollution, citing sewage discharge, contamination of bilge water, leaking fuel tanks and spills and careless disposal of trash ashore.

3.3.3. Water Sport and Swim area

The area zoned for water sport and swimming area is located next to the boat parking area. In that area, assessing what could negatively affect the beach health is the first step to improving the health of Rubavu public beach. Based on the field visit, this area is crossed by a sewer system which is designed to collect rainwater runoff, domestic sewage, and industrial wastewater in the same pipe. Most of the time, the sewer system should transport the wastewater to a sewage treatment plant, where it is treated and then discharged to a water body. During periods of heavy rainfall, however, the wastewater volume in a sewer system can exceed the capacity of the sewer system or treatment plant. For this reason, sewer systems are designed to overflow occasionally and discharge excess wastewater directly to the lake. The rain water picks up pollutants that contain bacteria-laden pet waste and animal manure, fertilizers, pesticides, chemicals, gasoline, motor oil, antifreeze, soils and sediments. The polluted water flows into the lake. This sewer system is therefore source of the water pollution, human alteration of the beach, beach erosion are likely to harm the sensitive environment of the beach. The pollution limits its ability to be used for economic, recreational and aesthetic purposes. This can be a public health risk which can reduce property values, and can inhibit economic growth of the community.









Figure 9: Soil erosion on beach mangrove trees

Water from rain may cause the upstream sewer system to overflow if its capacity is exceeded during the rainy season. Since the discharges from sewer overflows contain a mixture of raw sewage, industrial wastewater and storm water, and it may result in aesthetic problems on the Sport and Swimming area of the beach. The algae blooms have grown out of control and are likely to produce toxic or harmful effects on people. Overuse of the beach has led to the gradual degradation of habitat. Walking on the beach sand has destroyed the old mangrove trees which allow the sand to blow away. Waves from boats close to the shoreline are also eroding the beach.

3.3.4. Childrens Park Area

This zone is reserved for children to play and have diverse activities. Therefore, it is required that all children have to enjoy with their own parents.









Figure 10: Current status of kid's park

3.3.5. Events Area

This is an area reserved for hosting events only. The host of the event at the beach park must respect and follow the beach management plan. There has been some mobile toilets located at the edge of this zone and its green grass should be protected from events participants and beach users (Jeong 2018). Since the site is used to organize wedding ceremonies by local community; this activity of using the site as wedding ceremony area may have different level of impact on the visitors. This activity will therefore have to immediately end if this site is to be developed (MINICOM 2013).









Figure 11: Current status of Events' area

As for holding of events and any popular activity along the public, the size, nature and organizers of any event or function may pose different level of impact on other beach visitors and residents. Because most of potential visitors would like to try to find the best events and festivals happening during their trip, they may examine the best festivals, shows, concerts, performances, and other great beach events on the beach's biggest events calendar. Looking for the events they may explore holidays, annual events and yearly-round events celebrating music, wine, and good old-fashioned family fun. That is why there is a national need to prepare for the events calendar for visitors to find event for today, this weekend, and this month and beyond.

3.4. Need for transforming the Beach

To convert the Rubavu Public Beach to International standards each zone will require an in-depth scrutiny and development of all areas including the environmental/ecological degradation, impacts on the flora and fauna, water quality, litter levels and cleaning requirements, safety requirements, beach maintenance and operations that offer extended beach lifeguard protection during very hot weather, provide cleaner washrooms and change rooms, reduce fouling by birds (especially bats on the Avenue of de la Cooperation) nuisance algae and floating debris, and respond better to storm debris and higher levels of use attributed to climate change.







4. PROPOSED DEVELOPMENTS ON RUBAVU PUBLIC BEACH

As earlier mentioned, the strengths of the Rubavu Public Beach include its strategic location on the lake and close proximity to the major tourism attraction of Volcanoes National Park; good waterfront setting and associated park which provide a significant resource for both domestic and regional visitors; strong hotel base mainly catering for the conference and tourism market; strong cultural heritage significance with some colonial buildings along the cooperation street; and surrounding landscapes with views over the Lake Kivu. There are however weaknesses which need to be overcome such as the poor environment; the urban rainwater and drain water into the lake through the beach zone, limited access roads to the beach area, lack of basic infrastructure and services; some unsympathetic development on the beach area such as old pier that adds to the poor image of the area; need for facilities such as toilets, cafes and services; poor environmental management of the area. Rubavu Beach Management Plan developed by (Jeong 2018) provides a comprehensive analyses of the type of developments and infrastructure required to transform Rubavu Public Beach, Avenue de la Cooperation and its environs into a well-managed beach of international standards. We have studied the proposed opportunities and investments provided in the Rubavu Beach Management Plan and we have adopted them into our report and provided comprehensive recommendations. The projects proposed in the Rubavu Beach Management Plan will be located on the Avenue de la Cooperation and the Rubavu Public Beach.

Below is an overview conceptual map of the project with proposed buildings and infrastructures









4.1. Developments on the Rubavu Public Beach Infrastructure and Facilities on Each Zone

Rubavu Beach Improvement Plan focuses on the section of beach between the Serena Hotel and rocky outcrops to the west. It is intended to recharge, upgrade and improve the image of the beach; and increase recreational and business opportunities for the local community in the area. The beach and the quality of the surrounding environment are of vital importance to the future of Rubavu City. Currently the beach includes some unsympathetic development that adds to the poor image of the area. It can accommodate a large number of visitors, which is important in its revenue generation potential, with ample scope and need to provide good and well maintained beach facilities. The landscape and a range of activities and facilities will transform the beach and surroundings. This section describes the proposed projects, infrastructure and amenities on the Rubavu Public Beach. Each zone will have different requirements according to the type of activity that is going to take place.

4.1.1. Sport Zone

The beach sports zone located next to Kivu Serena Hotel is easily accessible by walking from the "Avenue de la cooperation" and covers an area of 7317.24 m². The District of Rubavu has been using this area for beach sports like beach volleyball and other sand-friendly activities and it has in the past hosted international beach volleyball competitions.

4.1.1.1. Required Infrastructure and Equipment

Based on international standards on dimensions and size of the volleyball playing surface area (FIVB 2016), it is proposed that a new beach volleyball playing area is set up with the following dimensions: a rectangular and symmetrical playing area to include the playing court and the free zone. According to the International Volleyball Federation (FIVB), the playing court 'is a rectangle measuring 18 x 9 m, surrounded by a free zone which is a minimum of 3 m wide on all sides'. Thus, you need a space of min. 24 x 15 m to build a volleyball court (GIZ 2019). The free playing space is the space above the playing area, which is free from all obstructions. This free playing space shall measure a minimum of 7 m in height from the playing surface. The surface must be composed of leveled sand, as flat and uniform as possible, free of rocks, shells and anything else which can represent risks of cuts or injuries to the players; The lines must be of a colour which contrasts sharply with the colour of the sand. There should be two side lines and two end lines to mark the playing court. Both side and end lines should be placed inside the dimensions of the playing court. Court lines should be ribbons made of a resistant material, and any exposed anchors should be of a soft and flexible material.

4.1.1.2. Beach Volleyball Court Construction

To ensure high quality beach volleyball for the sports zone on Rubavu Beach, the facilities will require a good design and maintenance program during the planning and construction process to avoid complications with drainage, safety and anchoring of net system. Layout, design and cost of court may be affected by soil characteristics, drainage, type and depth of sand, etc. It is proposed that a standard sand volleyball court of length of 22 m is constructed with attention made on the layout, soil characteristics, drainage, type and depth of the soil. The posts and nets should be movable to allow other sports such as beach soccer and beach handball on the same court areas. Figure 12 shows an example of an area containing two sand volleyball courts plus an additional area for spectators.







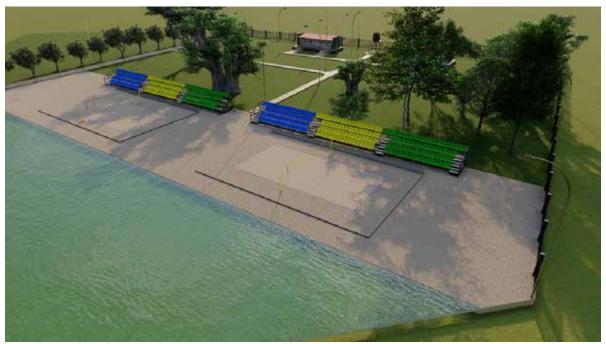


Figure 12: A two courts enclosure for sand volleyball plus a training court

4.1.1.3. Spectator facilities

It is suggested that benches be provided on the unused area and around the perimeter of the courts for the spectators. A wooden decked area is proposed for spectators and the waiting players can sit upon the barriers.

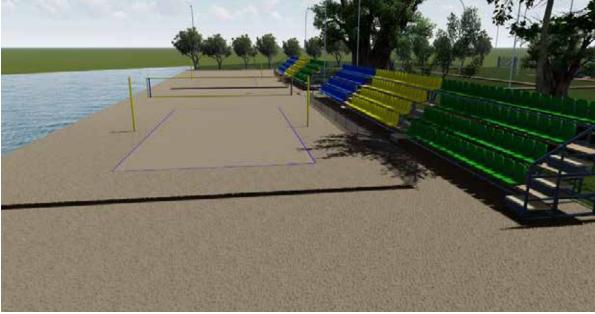


Figure 13: Spectator facilities on Sport area

Apart from volleyball, many types of sport activities can be organized on this sport area such beach sand soccer, handball, rugby and other sand-friendly activities.







4.1.1.4. Convenient sanitation facilities

It is proposed that adequate toilets, changing rooms and showers are constructed for the sport zone. There will be separate facilities for the players, supporters and children.



Figure 14: Proposed sanitation facilities on sport area

4.1.1.5. Green infrastructure and paths ways

As beach green infrastructure aims to respect and work with natural processes, it is a feasible response to mitigate or avoid the consequences of coastal squeeze on the beach areas as anthropic processes inducing changes with long-term negative consequences on the lake water (Chávez et al. 2021). The green infrastructure includes the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, storm water harvest and reuse, or landscaping to store, infiltrate, or evapo transpiration storm water and reduce flows to sewer systems or to surface waters. The nature-based design solutions can protect other proposed hard infrastructure of the beach area. These options have the advantage of being natural in appearance and may allow for certain coastal and beach processes to continue.

Runoff from storm water continues to be a major cause of water pollution in urban areas. It carries trash, bacteria, heavy metals, and other pollutants through storm sewers into local waterways. Heavy rainstorms can cause flooding that damages property and infrastructure. This highlights the need for site specific designs that reflect variation in local geography, wave, and beach conditions.









Figure 15: Required Green infrastructure and paths ways on sport area

The gardens and trees, as part of green infrastructure, will absorb and filter the storm water. This will have a lowering effect on bacteria concentrations in the sand and adjoining waters of Lake Kivu. As recommended by Rubavu Beach Management plan, visitor to the beach will always need the shaded campsite and picnic ground. Shade from trees cools hot streets and trails on the beach park. Even grasses, trees and shrubs add beauty and grace to any beach. They make life more enjoyable, peaceful, relaxing, and offer a rich inheritance for future generations. Grasses, trees and shrubs give people a multitude of recreational opportunities, prevent or reduce soil and sand erosion. Trees help us experience connections with our natural heritage and with our most deeply held spiritual and cultural values. The conservation of shade tree program is needed to protect and maintain the mangrove tree on the beach should be revaluated where roots trees are damage and leaning. The Rubavu Public Beach should conserve its unique character of being covered by mangroves on the beach park area. The District has to take the permanent measure for this conservation and shade program and implement continuously to make sure the trees are not destroyed and make sure to heal and repair damaged tree roots quickly.

This conceptual design integrating the green infrastructure on the sand beach sport zone is well aligned with REMA guidelines for rational management of lakeshores towards sustainable in Rwanda. These guidelines state that, in some cases, buildings or structures will need to be sited within the 50 m buffer zone (e.g. docks, jetties, tourist facilities). Some structures will need to be made from reinforced concrete (e.g. a dock for large boats on Lake Kivu). Any structure within the 50 m buffer zone should be made from locally-available materials; make use of wood and thatch; have a small footprint; and have a ground surface that promotes infiltration (e.g. grass, porous paving, and pavers with grass between). If a concrete slab is essential, the ground should be prepared with minimal soil disturbance. Wood poles and thatch can then be used to provide a shelter. Ensure that the site has adequate drainage. Structures that require a deep foundation should not be permitted within the 50 m buffer zone. Trees could be planted in the buffer zone as a component of rehabilitation programme. Grasses could also be used to stabilize soils and provide resources and environmental to people living near lakes (REMA 2020). Before







implementing the proposed development projects in sport zone, investor and developer should strongly collaborate with REMA in order to get further clear guidelines and evidence based supported by an Environmental Impact Assessment study.

4.2. Boat Parking Area

4.2.1. Current Situation

Boating on Kivu Lake presents many opportunities for fun and relaxation. With the efforts in place, water transport on Lake Kivu will boost trade between Rwanda and the DRC which is Rwanda's largest regional trading partner with 79.7% of the export market. Rwanda's exports to the DRC accounted for 83.3% of the country's total informal cross-border trade in 2017. Rubavu public beach has been sharing the dock constructed with concrete and iron materials in the middle part of the beach. The current location of the boat docking right in the middle of the beach is not appropriate for the management of the beach. This is within the same location as the swimming zone and it poses a big risk.

The main hazards posed by the location of the boat area are the close proximity of the swimmers and the boat can cause a serious collision; pollution of the water caused by discharge from the boats, leaking fuel tanks and oil spills; discharge of sewage and contamination of bilge water; and the boats mooring at the dock may damage the surrounding shoreline.











Figure 16: Existing boat basin

4.2.2. Proposed infrastructure on boating area

Based on an analysis of the existing situation and interview with boat operators, it is proposed that the boat docking facility is moved to the far end in front of the event zone. The total length of the beach is 850 meters and it may not be possible to have too many activities along the shoreline. It is therefore recommended that the dock type is a floating dock made of floating timber or poly-tub floating material. Both are environmentally friendly, easy to install with low maintenance costs.



Figure 17: Proposal for upgrading existing boat docking area

The proposal for upgrading existing boat docking area should consider the already Kivu Belt Master Plan for marinas development in Rubavu where ferry services, private boat rentals will be offered through the Lake cruise boats, boat hire and canoe hire with a network of pick up and return stations along the Lake.







The standard of boats will need to be well above the current offers as international tour operators are facing very stringent legal obligations.

4.2.3. Developing a New Boat Docking Area

The existing boating facilities are too old as they have been constructed in 1950s. During the focus group discussion with boat operators and photographers, the proposed infrastructure, facilities and services to be added on the boat parking area included access paths for pedestrians; small shops for soft drinks; electricity for light and phone charging; restrooms functional washing, an upgraded boat parking area information desk, dressing room, restaurants, canteen and coffee shops, a working space to accommodate photographers operating on the beach. The potential suitable site for relocation of boats from the middle of the Rubavu Public beach should be found near Events area towards the Western Part of the Beach. This potential site for boats docking areas are located within 2 minutes waiting time. Guided by the REMA guidelines on port development, any facility developed to move goods and passengers on a lake would need to be constructed on the water's edge and therefore within the 50 m buffer zone. The final decision on the candidate should also depend more on Lake Bathymetry and on road access than any impact on lakeshores (REMA 2020). Owing to the constraints on suitable sites, ecological sensitivity of the lakeshore will be a minor consideration as the site is not likely to be on steep slopes and can be easily access by the road from Gorilla Hotel. Figure below illustrates the new boat docking area to be developed on Events Area.



Figure 18: Proposed New Boat Docking Area

As the shipping boat activities may conflict with recreational boating on a very small size boat parking area on Rubavu Public beach, it was recommended to relocate some boats to another docking site when some boats can park and come to the beach areas on request. Before taking the final decision on developing this second docking area on Rubavu Public beach, there is need to seek a specific guidance from Rwanda Transport Development Agency (RTDA). While port sites should be limited to the main urban areas on the Lake Kivu, a detailed ESIA will be required to compare the suitability of the proposed site in order to ensure that stringent environmental controls are instituted during construction and







operation (REMA 2020). Aspects to be considered when developing the new docking area are provided in the following table

Table 4: Aspects of port development for Kivu Lake

Main feature	Requirements	
Silting	Near major population centres; avoid ESA and wetlands	
Use of port	Facilities needed for movement of large quantities of goods and passengers;	
	fishing, water sports; tourism	
Type of structures	Concrete piers near major population centres; small jetties in association with	
	tourist resorts; appropriate fish landing sites near the markets	
Other facilities	Storage sheds, passenger waiting areas built outside the 50 m buffer zone;	
	septic tanks to be outside 50 m buffer zone; re-fuelling facility for ships to be	
	allowed in 50 m buffer zone, storage with spill containment strategy.	
Road access	Only required in the 50 m buffer zone at ports/docks where significant goods	
	are to be shipped.	
Safety	Maritime safety protocols required; life jackets to be provided for tourists	

Source: REMA 2020

4.2.4. Proposed Infrastructure and utilities on boating area

The boating area needs to be upgraded to a higher standard to include infrastructure and utilities such as adequate lighting and CCTV cameras for security reasons and electricity power line with socket installation. It is pointed out that the power lines should be located underground whenever possible. The landscaping that conforms to park standards and aesthetic purpose. Harmful weeds and invasive plants should be removed; pathways, sidewalks, and pedestrian gradients should be provided and free of obstructions. These surfaces area have to be well-maintained and free of tripping hazards. Public signs should be appropriately located, accurate, and well-maintained. The sufficient trash containers should be provided and conveniently located. The waste should not accumulate in trash containers to the point of overflowing and refuse should be stored in covered.





Based on interview with the boat operators and drivers on Rubavu Public Beach, the shelter and boat waiting room were highlighted as the most important infrastructure that need to be constructed on the beach. These infrastructure and structures are mostly needed especially during the rainy season. The Boat waiting area to be planned on Rubavu Public beach will include boat office entrance and waiting area furnishings constructed near the boat area.

4.2.4.2. Boating Signs and Labels

The boating signs and labels are best used at docks and in areas where boats are moored or are moving through water. They are to remind boaters of safety and environmental rules and regulations, caution

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about the use of the water, warn of prohibited activities, notify of dangerous hazards and provide general boating notices. The boat signs on Rubavu Public beach will be appropriately located on the boat docking area and will highlight the boating safety procedures and requirements by using these bold and easy-to-read signs. For extra visibility, reflective signs that are seen clearly during the day and night will be used.

4.2.4.3. Dock lights

Dock lights are also a safety necessity in docking area of Rubavu Public Beach. They should illuminate the travel lines during the night as the boat enters or leaves a docking area, creating a safer environment for boat operators and users. They also add a touch of class and elegance while keeping boat users safe.



The required lighting should be adequate and appropriate. Light fixtures should be clean and operational, with no empty sockets or burned-out bulbs. Upgrading the dock lights on Rubavu Public Beach will help to solve the problem of the security and safety service for boat users especial during the night as highlighted by boat operators during the interview.

4.2.4.4. Restrooms

It is proposed that toilet facilities are provided on the boating area.









The public toilets on boat areas should be always clean, illuminated, and well-maintained. Toilets, sinks, and urinals should also be clean, free of stains and chips, and operational. Toilet tissue and disposable towels or hand dryers should available. Soap should be provided in bulk dispensers. The disposal containers should be clean and emptied at least daily.

4.3. Water Sport and Swim Area 4.3.1. Key considerations

The water sport and swimming area is located next to the children's playground. It extends on an area of 660 m². In order to ensure safety, health and reduce the risk of drowning, a number of measures must be put in place including the mater quality, beach shore and boundary of the swim area.

- ❖ Water quality: Environmental contaminate factors, such as sewage treatment systems, storm water runoff, adjacent creeks and rivers, on-site sewage leaching, and other potential factors to affect the water quality should be avoided on the swim designated area on Rubavu Public Beach. This can help to prevent some disease outbreaks related to poor water quality. Environmental contaminants in the water can cause recreational water illness that affects a person's stomach and intestinal system, skin, and lungs. A study on anthropogenic pollution impact on microbial contamination of Lake Kivu by (Olapade 2012), indicated the high microbial load in the sampling locations of the Rubavu Beach, originating from anthropogenic wastes. This study stressed the need for controlling the quality of effluents entering the lake in order to reduce the pollution load and enhance suitable environment for sustainable conservation of the aquatic resources. This can be achieved through pre-discharge treatment of wastes, construction of screens across flood water pathways, and the provision of toilet facilities for communities around the lake. Good practices of hygiene also need to be encouraged. Monitoring water quality on Rubavu Beach swimming zone can therefore help to reduce recreational water illness. There is a need to obtain multiple samples on a regular schedule and to monitor the water quality to improve the accuracy of sampling.
- ❖ Beach shore Area: It is important that the shore area in-front of the swimming zone does not have any obstructions and if possible there should be at least 9 meters of unobstructed shore area. All under water must be observed closely and any underwater obstructions, such as rocks or weeds should be removed or visible warning signs should be placed on the water surface and on the shore.







Steep slopes and sudden drop-offs in the water can be a drowning hazard. These should also be clearly marked to warn all swimmers.

4.3.2. Boundaries of the swim area

The boundary of the designated swim area on Rubavu Public Beach should be well-marked to prevent other water activities from entering that area. This well-demarcated boundary will provide a safer area for people to swim and play. It may consist of anchored artificial floats connected with ropes, buoys marking the perimeter of the swim area, or other floating materials such as connected logs.



Many studies reported that the Lake Kivu contains vast quantities of gas, which makes it both dangerous and valuable (Nayar 2009, Doughty 2020, Doughty, Uwizeye and Uwimana 2021). Being located in active volcanic region, the Lake Kivu contains a higher concentration of CO² than the other lake basins. This CO² hazard exists at specific sites where lava flows come into contact with Lake Kivu water and emit CO² through the lava front. The emitted gas then spills onto the lake's surface, depletes the ambient air of oxygen, and leads to respiratory disorders, dizziness, and convulsions and subsequently may cause the drowning of the swimmers (Balagizi et al. 2018). In silent conditions, swimmers could lose consciousness and drown without warning. These drownings were previously attributed to gas ascent from the deep layer of Lake Kivu, but diffuse gas ascent to the surface does not reach lethal concentrations (Borges et al. 2011, Borges et al. 2012, Borges et al. 2014). Given that the CO² rich water can be found at just at 11 m depth, particular attention should be given to this swimming designated zone. There should be a continuous monitoring of the Kivu lake basin to identify, at an early stage, any increase in the gas concentrations to provide warning when the gas total pressure approaches saturation. Because earthquakes and eruptions of Nyiragongo are also potentially able to trigger an overturn of the Lake Kivu, seismic and volcanic monitoring should not be separated from that of the lake. A full survey of the lake edge for gas emissions is also warranted. Finally, mapping and monitoring of the ground gas emissions should be an urgent objective of the volcanologists. A deep study to know the boundary of the safe zone swimming on the beach area will be needed.







4.3.3. Proposed Infrastructure and facilities

4.3.3.1. Diving platforms

It is proposed that a diving platform is provided for the Rubavu Public Beach for recreational purposes. It is however pointed out that while diving platforms provide a place to rest and to have fun in deep water, but they can also become a safety hazard. There is potential for getting trapped under the platform, slipping on the platform, or falling off the platform. Safety measures must therefore be put in place for any diving to be done when life guards are available.



In addition to the factors for swim platforms, dive platforms require:

- *Minimum water depth:* Dive boards or platforms less than 0.50 meters above the water level should have 3 meters of water depth for 4.8 meters horizontal distance beyond the diving platform.
- Handrails: Include handrails on each side of the diving board when the board is greater than 0.50 meters high above the water. A bar between the top rail and the dive board, or an intermediate rail, will be important to prevent smaller children from falling through handrails.
- Secure: Secure the dive board according to manufacturer instructions.
- *Position:* Position dive boards facing north or northeast, when possible, to reduce issues with glare from the water.
- Life Guard: To ensure maximum security, there will be a life guard on duty on a full time basis.

4.3.3.2. Water slides

This activity is proposed to be located in front of the swimming zone. The concrete docking area can be converted into a swimming pool where the water slides will use as landing area.









Figure 19: Proposed Artificial Slide on Boat basin Area

4.3.3.3. Beach Wheel Chair Access

A beach wheel chair access will be very important in order to cater for all the visitor needs. The wheel chair rump must be conveniently located to facilitate easy movement from the car park right up to the beach zones. As proposed in the Rubavu Beach Management Plan, a solid wooden cover installed on top of the conventional concrete sewage that passes through the beach can easily be used to make the beach access.





Source: Rubavu Beach Management Plan 2018

4.3.3.4. Restrooms

A restroom facility is recommended at the swim area of Rubavu Public Beach. This facility should be at certain distance from the beach shore area and should include the followings: A locker room with







separate facilities for each gender; sufficient toilets, sinks with soap dispensers, and showers to meet the number of expected beach or swim area users; easily cleanable floor or wall interface preferably coved; waste from bathhouse facilities shall be taken to sanitary sewer or in an approved wastewater treatment facility; and trash bins in sufficient numbers to prevent buildup of garbage on the beach swimming area. The location of the public toilets should be readily accessible to spectator viewing areas.

4.3.3.5. Chairs, Tables, and Umbrellas

It is recommended that a variety of chairs, tables, and umbrellas are made available in the swimming zone of Rubavu Public Beach. For sunbathing, the reclining lounge-style chair is recommended. Some



Figure 20: Proposed chairs and on beach area

Movable umbrellas are good for shaded, informal seating areas. To facilitate storage, the stackable chairs can be used where possible. Chairs and umbrella fabrics that are moisture-resistant are designed for outdoor use.









4.4. Childrens Playground Zone

The current size of the children's park zone on the Rubavu Beach covers an area of 9977.85 m² (20.68% of the total beach area). This zone is reserved for children to play and have diverse activities. However, currently the zone lacks all the required infrastructure and equipment to qualify as a well-managed children's playground on international standards. The Figure show the location of the area designated for kid's park area on Rubavu Beach. It is proposed that the Childrens Zone on Rubavu Public beach is developed into an active outdoor play area that is interesting and safe for children of different ages. The current status of the zone shows an open space with no facilities, games or equipments as illustrated in below photos.









Figure 21: Current situation on kid's park area

4.4.1. Key challenges to be addressed

Other key challenges noted on the children's park include the presence of concrete structures on the children's zone which may cause accidents to kids playing. It is therefore proposed that these structures are converted into usable facilities.











management and purification.

In Gisenyi, it rains with some regularity. Because of the difference in height with the hinterland, it is a challenge to drain this water in a controlled way. Currently, the rainwater is superficially drained via an open gutters that eventually discharge into the Kivu Lake via a large pipe. Up to the "Avenue de la Cooperation", the water is discharged superficially. This takes place at the side of the green strip that runs along the square towards the lake. Once it reaches the boulevard, the water continues underground and is collected in a water storage system. The infrastructure improvements strategy can provide separate sewer systems for rainwater and waste water and their

Basically, the sustainable solution for the drainage system through the beach is to close this rainwater drain. The waterway should be turned to other areas to minimize any contamination of the beach's water quality. However, if the use of these drains is unavoidable, at least a concrete reservoir in the middle of the ditch must be installed to collect garbage and sewage, so that the impurities can be concentrated temporarily in a place. Therefore, it is necessary to create such facilities where sewage can temporarily settle at a certain place and impurities can be integrated into one place. If cleaning the floor regularly by opening the cover of the concrete reservoir is performed continuously, water quality can be protected in a more effective way. Immediate actions should focus on improving the Childrens zone and providing efficient management through the provision of various children's games and equipments, a convenient access walkway to this zone direct from the "Avenue de la Cooperation", and adequate toilets and wash rooms. It is also necessary to ensure that there are fast food and ice-cream carts on the zone and adequate benches and seating area for parents.

4.4.2. Guidelines for outdoor children activities

While each child develops in an individual way, these guidelines can help in assessing the suitability of outdoor equipment and activities that can be planned or provided on kid's park area for children of different ages. Below are guidelines for children's activities according to each age group.

Table 5: Guidelines for suitability of outdoor equipment and activities for children

Infants (0-15 months) Push and pull up; Sit without support; Crawl; Cruise or walk using objects or adults for support; Begin to stand and walk alone. Soft surfaces; Shade; Tactile materials; Water and sand; Objects to crawl through; Places to sit with adults; Wind chimes and other sensor materials;	Age Developmental milestones		Recommended equipment	
■ Safe plants to smell and touch;		 Push and pull up; Sit without support; Crawl; Cruise or walk using objects or adults for support; 	 Shade; Tactile materials; Water and sand; Objects to crawl through; Places to sit with adults; Wind chimes and other sensory materials; 	







Toddlers (15- 33 months)	 Become increasingly mobile; Push and pull toys while walking; Learn to climb stairs; Begin to use riding toys (with feet on ground); Run short distances; Squat and balance on feet while playing; Kick and throw balls; Jump in place. 		Climbing structures; Slides; Water and sand play equipment; Places to crawl through, over, under Riding toys; Sensory materials to engage sight, sound, touch, taste; Structures (like playhouses) for make-believe; Shady places to sit; Loose parts for creative and
Young	Highest activity level of any age in the human	•	imaginative play; Places to run, throw balls, play. Structures for climbing and sliding;
Preschool (2.9-	life span;	•	Riding toys and paths to ride on;
4 Years)	Increasingly more adventuresome;	•	Riding toys and paths to ride on;
	Run back and forth;	•	Balance beams;
	Throw and catch balls;	•	Playhouses;
	Pedal a tricycle;	•	Water and sand play equipment;
	Somersault;	•	Loose parts for pretending,
	Climb stairs;		creating, building;
	Push and pull larger toys like a wagon;	•	Talk tubes;
	Enjoy showing off climbing prowess;	•	Telescopes;
	Hop and jump increasingly well;	•	Places to run, jump, play ball;
		•	Places to paint, draw and create;
Older	Physically competent;	•	Climbing and sliding structures that
Preschool (4-5	 Climb well, enjoy trying to go higher and 		provide challenge for increasing
Years)	higher;		skills;
	Enjoy challenges;	•	Bikes and paths to ride on and
	Roll balls;		explore;
	 Skip on alternating feet; 	•	Water and sand play equipment;
	Able to begin riding two-wheel bike.	•	Art studios;
		•	Structures for imaginative play;
		•	Loose parts to enhance play;

Source: (Pardee, Gillman and Larson 2005).

4.4.3. Recommended equipment and facilities

The availability of park facilities may play a more important role in promoting physical activity and healthy weight status among children than availability of park space in general. Since the kid's park zone is located in economic zone, it is recommended to develop this zone a commercial playground that has some equipments used for different activities. The following are the descriptions of equipment items which are particularly suitable for all children. For convenience, these items are grouped according to the developmental area most likely to be challenged by the equipment. However, many of the equipment items will enhance several developmental areas of the children such social, emotional, perceptual motor, physical, sensory and intellectual.

4.4.3.1. Children's Equipment for Social and Emotional Development

Many children with special needs require more support in the areas of social/emotional development than do other children. Children with a physical, or a sensory disability may have had limited







opportunities to interact with other children, or may have seen treated differently by the children they did encounter. Emotional immaturity is commonly found in children with special needs particularly, until they acquire the experience required to develop acceptable social behavior. Children with severe social or emotional problems may lack internal controls, or may be too internalized to be readily accepted by other children. Children with limited intellectual development often respond socially and emotionally like younger children. The universal playground environment should have areas that encourage social interaction and be easily supervised. The following are the children's equipment proposed for social and emotional development on Kids park zone of the Rubavu Public Beach.

Table 6: Children's Equipment for Social and Emotional Development

Equipment	Goals and benefits	Description
Work and Play Tables	Promotes quiet, cooperative activities alone or in small groups.	Tables may be plain or have inlaid design. Tables should have sturdy benches. Preferably with backrests.
Sand Table	Promotes quiet. Cooperative play alone or in small groups. Encourages imagination creative activities.	A sandbox mounted on a table.
Sand Crane	Promotes cooperation and social interaction.	A pulley system with a rubber scoop attached to a chain or cable. It requires 2 children to operate: one to fill the scoop and another one to operate the pulley.
Play Counter	Encourages imaginative play with other children.	A counter top usually mounted under a platform which provides shelter.
Play Hut	Encourages imaginative play. May also be used as a non-punitive timeout area	Sheltered area with some privacy but open enough to easily supervise
Steering Wheel	Encourages imaginative play either alone or with other children	Steering wheel mounted on a post or beam
Sympathetic Swing	Promotes integration and cooperative interaction	Geared to a neighborhood swing. It is propelled when the child's able bodied companion swings.
Wheelchair Ramps	Encourages socialization.	Should be long enough to provide 1:12 grade and be 5 feet wide with handrails at two heights. Should be built to enable access to playground equipment. May also provide a play area for all
Tunnel	Encourages socialization.	Tunnel
Wide Slide	Encourages socialization	Double the usual width, enabling two children or one child with one adult to slide down side-by-side.

4.4.3.2. Children's Equipment for Perceptual Motor Development

Some children with normal development may encounter unusual difficulties with gross and fine motor coordination. Others who appear to have normal hearing and vision, may have trouble perceiving shapes, form, depth, movement or a variety of cognitive concepts. This can result in learning disorders, although children may have average or above average intellectual ability. Such difficulties can be attributed to impaired or delayed neurological development. Children with perceptual-motor delays may lack coordination, or have a tendency to be accident prone. Supervisory personnel may need to be more attentive to such children. In general, however, playground experiences are positive for these children and offer an opportunity to improve their coordination skills. Not all children identified as learning disabled exhibit poor coordination: some perform well in athletic activities and should certainly be encouraged. The following are the proposed equipment for perceptual motor development of children in the kid's park zone.

Table 7: Children's Equipment for Perceptual Motor Development







Equipment	Goals and benefits	Description
Tire Swing	Improves balance and	Swing with a tire for a seat, suspended from a single point. Can seat
	coordination	one or more children.
Spring Teeter-	Improves balance and	Comes in models for two, three, four, or even more children.
totter	coordination	
Spring Rides	Improves balance and	Mounted on sturdy coil springs, topped by colorful stylized animal
	coordination	forms.
Standard	Improves balance and	Two point suspended swing with soft scat or supportive harness seat.
Swing	coordination.	
Tire Roll	Improves balance and	Mounted on an axle. Child stands on device while it rolls beneath his
	gross motor skills.	feet. handholds are provided
Balance Beams	Improves balance and	Installed a short distance above ground.
	gross motor skills.	
Gadget Panel	Improves fine motor	A panel on which various devices such as faucets, knobs, latches, dials
	skills	and switches have been mounted.
Wide Slide	Improves	Double the usual width permitting 2 children or an adult and one
	perceptual/motor skills	child to slide together

4.4.3.3. Children's Equipment for Physical Development

Children come in all shapes and sizes, and with varying degrees of strength. The physical impairment may present a challenge to children who may require a wheelchair. Because many children with physical disabilities move more slowly and require more space, there may be concern that they could interfere with the free passage of other children, create hazards, or monopolize the utilization of certain pieces of playground equipment. In designing the universal playground, multiple access and exist points, and additional space are needed to minimize potential problems. The following are the proposed equipment for physical development of children in the kid's park zone.

Table 8: Children's Equipment for physical Development

Equipment	Goals and benefits	Description
Hand-over hand bars	Improves upper body strength and coordination.	Overhead bars at different heights.
Chinning Bars	Improves upper body strength.	Chinning bars at different heights.
Parallel Bars	Improves upper body strength and coordination, and balance.	Can be either horizontal or inclined.
Adjustable basketball' loop	Improves upper extremity strength and eye-hand coordination.	Basketball hoop adjustable to different heights.
Cargo/ Chain/Tire Nets	Improves upper and lower extremity strength.	Can also serve as safety device below high towers.
Tube and Half tube Slide	Improves upper and lower extremity strength.	Enables child to slide independently.
Stairs and Inclined Ladders	Improves upper and lower extremity strength.	Wide enough to permit children to pass; going up, down or sideways. Can be negotiated using arms or legs.
Bridges	Improves balance and coordination.	May be tire bridges, clatter bridges or other modifications.

4.4.3.4. Children's Equipment for Sensory Development







Children with severe visual impairments become more dependent on other senses, especially hearing and touch. Children playground design and equipment incorporating texture, manipulative devices, bright colors, and sound are particularly helpful for children with low vision. This may require creativity in terms of including them in group play activities. The following are the proposed equipment for sensory development of children in the kid's park zone.

Table 9: Children's Equipment for sensory development

Equipment	Goals and benefits	Description
Music Panel	Stimulates auditory	Incorporates a number of music producing devices that can be
	discrimination	sounded with a stick or by hand.
Colored Panels	Stimulates visual awareness.	Different colored panels placed side by side or throughout the
		area.
Bucket Table	Stimulates visual awareness.	Table with water and a bucket or buckets.
Sand Box or	Stimulates visual awareness.	Table or box with sand in it and ideally covered when not in
Table		use.

4.4.3.5. Children's Equipment for Intellectual Development

Most children with special needs have normal intellectual development. However, it may be more difficult for some children with pronounced physical, sensory, motor or emotional challenges to demonstrate this. Play areas which encourage intellectual exchanges can help facilitate integration among all children. Children with delayed intellectual development require experiences to enhance social, emotional and motor development. The universal playground needs to have a broad range of equipment and activities which appeal to all children, regardless of intellectual development. Below in Table 10 are the proposed equipment for intellectual development of children in the kid's park zone.

Table 10: Children's Equipment for intellectual development

Equipment	Goals and benefits	Description	
Tunnel	Concepts of in, out, through and across.	Tunnel.	
Bridges	Concepts of over, under, up, down, high and low.	May be clatter bridges, tire bridges or other modifications	
Walls with colors and shapes on them	Concepts of shapes and colors.	Modular panels with different shapes cut out or with different colors.	
Bucket Table	Concepts of conservation of material, volume and measurement.	Bucket table with water in it and a bucket or buckets	
Relief Maps	Improve orientation and develop spatial concepts.	Relief maps of playground.	
Guide Rails	Improve orientation and develop spatial concepts.	Guide rails around and at strategic locations throughout the playground.	

















4.4.4. Pathways and seating facilities

In order to maximize children's play experience and ensure their safety around play structures, appropriate circulation routes or pathways should be planned and provided. It is necessary to avoid laying out long straight paths in favor of shorter. Paths of varying widths should provide a clear route around the play area, ensuring that children do not interfere with each other's play or encroach on the safety zones around large equipment.











While planning for seating for children and adults in various areas outdoors, it is recommended to use benches, tree stumps, picnic tables or other types of seating. Old blankets for picnics and story time, several places to sit and watch the action should also be provided. Benches and wooden chairs should set along the edges of the children's zone. These picnic tables can also be used by visitors when it is desired to have attached seating to tables for outdoor activities. Each table usually seats from six to eight people, though smaller and larger capacity tables are available.

4.4.5. Safety and supervision

To ensure the safety of the children a number of measures must be put in place: clear sight lines from all locations of the playground; CCTV cameras covering all sections of the playground; adequate supervision with qualified minders; well-lit washrooms and changing rooms with no dark corners; and supervision of toys and equipment to ensure all are in good and safe working condition

4.4.6. Play Area and play structure

Different games and activities are proposed for the children to play on as depicted below:



Other proposed structures that can be included on the children's playground include the following:







Climbing structures



Climbing Castles



Slides









❖ Swings



Trampolines









Balance beams can be purchased, but can also easily be built on site with landscape timbers, bricks, boulders, or lumber rounds.

4.5. Events Area

The event area is located at the far end of the site area next to the children's zone and is covering covers a total of 1518 m². Even if the District of Rubavu has been hosting events in this zone, there is however no adequate infrastructure on the site to cater for the services of events to be hosted on Rubavu Public Beach. A number of development measures therefore are required to convert this area to international high standards. The below image illustrates the desired state of the Events designated area.











Figure 22: Desired state of Events designated area

On Event Zone, the outdoor events which do not require the concreated and permanent structures should be given the high priority in order to reduce the number of structure on the beach area.







4.5.1. Infrastructure and Equipment Required

4.5.1.1. Signage

This is an area that will be hosting several people at one go. Clear directional and safety signage is therefore mandatory. To prevent crowding and chaos the signage must be clear and concise directing guests to the areas they are looking for. Most relevant signage require will be for the toilets, entrance, exit, serving tables, high table and the registration or information desks. As an example, the image below shows how the entrance to the Events designated area should look like.



Figure 23: Proposed entrance design on Events designated area

4.5.1.2. Tents and structural safety

It is recommended that all setting up of tents or other temporary structure are only done by reputable companies in order to prevent structure failure and collapse during events. Hazards include trip hazards; heavy rain running off roofs, overhead power lines and tree branches can cause hazards; and fire hazards in the use of materials, decoration and electrical supply. Rubavu Public Beach is prone to heavy rains and strong winds. It is therefore recommended that heavy duty event tents made of the appropriate material is used to set up the tents. Attention should be given to the issues on the maximum wind loading that the tent can withstand, monitoring of the wind strengths on site using an anemometer and ensuring an adequate number of fire exits clearly marked are provided.









Figure 24: Conceptual design of the new docking area

4.5.1.3. Barriers and fences

The most common events taking place on the Rubavu Public Beach are weddings. Normally these carry a large number of people confined in one space. Effective crowd control and management is very important. It is recommended that barriers are used to secure the site, control the entrances, and control the crowd movement and preventing people from entering prohibited or private areas. Types of barriers can range from simple rope and post to fencing depending on the event that will be hosted on the beach.

4.5.1.4. Fire prevention equipment

An adequate number of the appropriate types of fire extinguishers and other types of fire suppression equipment should be provided in key positions, such as close to catering areas. Dependent on the type of event to be held on the Rubavu Public Beach, it may be necessary to have a standby fire watch team who can act quickly in the event of a fire. This includes event that make use of fire crackers to celebrate New Year or other festivities

4.5.1.5. Toilets

It is proposed that permanent toilets are constructed on the edges of the event zone to effectively cater for the crowds of visitors. These will be separated into male and female with clearly marked signage to direct visitors. Maintenance and cleanliness of these toilets will be top notch with qualified personnel assigned to each to ensure cleanliness and adequate stocking of supplies. In both the male and female toilets there will be provision of disability toilets to cater for old or the impaired. The equity and inclusion criteria have been therefore taken care of in the universal design in order to address the needs of some individuals with unique needs due to illness, disability or age.

4.6. Minimizing earthquake and volcanic eruption damages

The intensity of an earthquake shaking is directly related to the type of soil layers supporting a building. The building structures built on solid rock and firm soil frequently perform far better than the buildings







on soft ground. The earthquake damage on soft soils located far away from the epicenter may be considerably higher than at closer locations to epicenter. Similarly, buildings on deep soil sites are more likely to collapse, while buildings on the rock subsoil near the mountainous areas are less susceptible to earthquake shaking. Buildings on flat terrain are usually less damaged during an earthquake than buildings on ridges and on steep slopes.

The extent of building damage induced by earthquake also depends on many other factors such as the strength, ductility, and integrity of a building, and the stiffness of the ground beneath it in a given intensity of the earthquake motions. Any building can be designed to avoid earthquake collapse provided its site is suitable. Buildings suffer damage during an earthquake primarily because horizontal forces are exerted on a structure that is often meant to contend only with vertical stresses Arya, Boen and Ishiyama (2014). Based on the national contingency plan for earthquake-prone areas of Rwanda, building structures should be well-designed and reinforced in order to make them more resistant to seismic activity, ground motion, soil failure due to earthquakes. Earthquake Early-Warning system should be established to provide a warning message prior to ground shaking in order to reduce the earthquake damage, costs and causalities (Republic of Rwanda 2019). The following factors that influence the damage to buildings and other built structures should be taken into consideration:

- **Building configuration:** A building shaped like a box, rectangular both in plan and elevation, is inherently stronger than one L shaped or U-shaped, such as a building with wings. An irregularly shaped building will twist as it shakes, increasing the damage.
- Opening size: Openings in walls of a building tend to weaken the walls, and the fewer the openings the less the damage suffered during an earthquake. If large openings are needed in the building, special provisions should be made to ensure structural integrity.
- Stiffness distribution: Horizontal stiffness of a building up its height should be uniform. Changes in the structural system of a building from one floor to the next one will increase the potential for damage, and should be avoided. Columns or shear walls should run continuously from foundation to the roof, without interruptions or changes in material.
- Ductility: Ductility is the ability of the building to bend, sway, and deform by large amounts without collapse. The opposite condition is brittleness, arising from the use of materials that are inherently brittle and from the wrong design of structures using otherwise ductile materials. Brittle materials break under overload; some examples are adobe, brick and concrete blocks. It is not surprising that most damages during past earthquakes in Rubavu City were mostly observed to unreinforced masonry structures constructed of brittle materials, poorly tied together. The addition of steel reinforcement can add ductility to brittle materials. Concrete, for example, can be made ductile by proper use of reinforcing steel and closely spaced steel ties, e.g. hoops in columns and stirrups in beams.
- Strength of buildings: Structures of buildings should have adequate strength to resist earthquake shaking and particularly the "rocking" effect. "Rocking" can occur in rigid normal houses. Therefore, all buildings components, i.e. foundations, columns, beams, walls, roof trusses, roofing, etc. must be tied to each other, so that when shaken by earthquakes, each building will act as one integral unit.
- Foundations: Buildings which are structurally strong against earthquakes sometimes fail due to inadequate foundation design. Tilting, cracking and failure of superstructures may result from soil liquefaction and differential settlements of footings. Certain types of foundations are more susceptible to damage than others. For example, isolated footings of columns are likely to be subjected to differential settlement particularly where the supporting ground consists of different or soft types of soil. Mixed types of foundations such as piles and footings within the same building may also lead to damage due to differential settlement. Very shallow foundations deteriorate because of weathering, and when exposed to freezing and thawing in cold climate regions.







Construction quality: In many instances the failure of buildings in an earthquake has been attributed to poor quality of construction, substandard materials, poor workmanship, e.g., inadequate skill in bonding, absence of "through stones" or bonding units, and improper and inadequate construction (Arya et al. 2014).

Since the proposed developments are located in seismic zone, an earthquake may happen and the damage is likely. However, through strategic and careful design and care consideration of aforementioned factors, the damage associated with an earthquake hazard risk can be reduced substantially. Things that must be prioritized when building an earthquake-resistant structure on Rubavu Public Beach and its surroundings may include for example:

- Structural steel: It is combined in multiple shapes to allow the steel to bend without breaking.
- **Wood**: It is a lightweight material that offers strong resistance to seismic activity thanks to a favorable weight-to-strength ratio.
- Bamboo: It can be shaped in multiple ways and also offers strong resistance to shaking.
- Memory alloys: are designed to endure heavy damage and revert to their original shape.

4.7. Legal Implications of Rubavu Public Beach Development

Facilities for Rubavu Public Beach should be sited in an area that is aesthetically pleasing. It must have easy access for tourists and a reliable supply of necessary goods and services. There are significant environmental impacts associated with the development and operation the tourism facilities. Since the project site of Rubavu Public Beach is adjacent to lakes, it is particularly important to consider its impact on ecological-sensitivity of the 50 m buffer zone that surrounds the lakes (Republic of Rwanda 2010). Any structure to provide beach services that is built within the 50 m buffer zone will require special permission. These structures should require a small foundation footprint so that soil disturbance is minimized and should use natural products for construction (REMA 2020). The Figure below shows the layout plan of the Rubavu Public beach development in one picture.



Figure 25: Layout plan of the Rubavu Public Beach Development Site

Site development will also need to consider proximity of sites for solid waste and wastewater disposal. Septic systems must be sited outside the 50 m buffer zone. Some buildings may need to be sited within







the 50 m buffer zone but these building should be included in the Environmental Strategic Impact Assessment (ESIA). Structures might include sun shelters and catering facilities (lakeside bar or restaurant). These structures should have a small footprint and be built from natural materials (wood and thatch roof). Examples of facilities that may, with appropriate approval, be built in the 50 m buffer zone include: a jetty and safe access to boats; small sun shelters made of wood and thatch; beach bar and barbecue area built with wood and thatch, and a small storage facility for leisure equipment (REMA 2020). The construction phase will need to address the following issues: soil erosion, waste generation, dust production, emissions from vehicles and land-clearing machinery, noise, spills of oil and other hazardous materials. Development of tourist facilities near the lakeshores pose additional challenges such as habitat conservation and water pollution. Methods to reduce impacts during construction include keeping construction areas to a minimum; locally available construction materials should be used; maximal use of recycled construction materials; and avoiding or minimizing the use of toxic materials and ensure suitable disposal methods are available.

The use of local stone and thatch should be encouraged. On steep slopes between 15-30%, buildings should utilize the slope with buildings with split levels. Alternatively, sections could be elevated on concrete block or brick pillars or wood poles. Buildings should be sited to provide visitors with views of the lake and landscaped grounds. Architects should be encouraged to design buildings that have a small foundation footprint so that soil disturbance is minimized. This can be achieved by buildings being elevated above the ground that will provide views and improve air circulation to cool buildings. The height of any building should be appropriate for the lake setting including the background, slope and tree cover. High visibility developments should be avoided, and the building should blend in with the background environment. Roofs should facilitate the collection of rainwater (REMA 2020). Paths and walkways should not be constructed with concrete or asphalt. Stepping-stone paths with grass between will be attractive and promote water infiltration. Steps, where needed should be made of wood or plastic wood (made from recycled plastic waste). Roads and parking areas should be unsurfaced or made with pervious pavers and not concrete or asphalt. Boat jetties at recreational boat area should also be made of wood or plastic wood.

Since some infrastructure have been constructed without respecting 50 meter buffer, it is not easy to ask to the owners of infrastructure and properties that have been built before the publication of the environmental law to move their infrastructure outside the 50 m buffer zone. Instead of demolishing the infrastructure, some mitigation measures might be taken by land developers to protect the lakeshore and water quality in the lake. Furthermore, the Revised Master Plan for Rubavu Secondary City (RHA and GGGI 2019b) proposes the following actions: A buffer of 20 meters shall be maintained along the lakes. The use and development of the buffer area shall require approval from the Rubavu District. The Rubavu District shall assess the application in coordination with relevant stakeholders. Upon evaluation, the Rubavu District may allow some recreational uses such as waterfront promenade with boating facilities, walking and biking trails and development of kiosks and amenities that may be required for the community and tourism promotion, as long as they do not disturb the buffer zone from the lakeshore. Some types of developments like bridges, roads, utilities etc. may be exempted if there is no alternative placement and disturbance to the buffer zone. No developments or uses allowed on the buffer shall contribute to the pollution of the water bodies and its surrounding. Any development that takes place within the buffer overlays and in immediate surrounding shall respect the environment and the landscapes of the surrounding areas.

The District of Rubavu should grant approval of developing the infrastructure and facilities which meets the minimum buffer requirement from the lake shore, as well as any other sector authority







requirements as per law. According to the revised master of Rubavu City, the tourism overlay zone allows the flexibility for city to promote tourism in certain areas as well as encourage or discourage certain types of development that may impact on the lakefront image. In that regards, The Sports and Eco-Tourism Zone was established to provide parks that offer active recreational uses with sporting facilities and forests with eco-tourism activities. All buildings in these zones shall adhere to the "Green Building Minimum Compliance Guidelines Government of Rwanda (2019)







5. BEACH MANAGEMENT PROCEDURES, MODELS AND SYSTEMS

5.1. Management Procedures

The well-developed Rubavu Public Beach and the Avenue de la Cooperation will require the implementation of stringent management procedures and systems in order to maintain standards. A key guiding factor in the beach management procedure will be the profit making areas and non-profit making areas which provide support infrastructure. To ensure efficiency, it is recommended that the private investor is responsible for the profit making areas while the public sector is responsible for the non-profit making areas. The district would therefore be responsible for the maintenance of areas like cleaning the public areas, maintaining "Avenue del a Cooperation" by ensuring it is clean, adequate street lighting, security, green areas, flora beautification, cleaning the toilets and showers on the beach, replacing the eroded soil on the beach, cleaning the beach public areas and all other non-profit jobs.. The Private investor would be responsible for managing the more sensitive profit making products like hiring out activities on the zones, running the shops and restaurants, paid car park and all others. The Investor would sign a lease agreement with the Rubavu District and pay an agreed amount of rent.

5.2. Management Models and Systems

The private Investor must ensure the services and products offered on the Rubavu Public Beach are comparable to international standards A well-managed beach plays a key role in the decision making process a tourist will make in choosing a destination. Tourists will be attracted to well-managed beaches that offer leisure, comfort, security and peace and any beach destination that is able to offer these attributes quickly becomes a favorite choice among the domestic, regional and international tourists. The private investor must therefore aim to maintain the Rubavu Public Beach with top notch facilities and manage the beach resources in a manner that respects the natural physical elements while satisfying the needs of different users including the tourists, local community, and the stakeholders. To implement and maintain international standards, the private Investor will need to implement an efficient beach management system that will provide a quality product to the visitors and ensure their security, protect the ecosystem, promote a beautiful natural environment and at the same time be a source of sustainable income for the local communities. The management system must be able to monitor and mitigate on any challenges or threats faced including water quality, pollution, litter management, urban and industrial waste, availability of toilets, ease of beach access, security on the beach overcrowding, damage to the eco system, management of competing interests (swimmers water sports, children's activities) among other challenges.

5.3. Beach Management Models, Eco Labels and Award Systems

As mentioned the Private Investor will require an effective Beach Management model that is able to ensure quality service and international standards are maintained. Apart from the beach management systems, Eco-labels and Award systems are also an important tool within the tourism industry that are used to ensure the effective management of a beach. They have become a popular and successful management system used to encourage beach managers to maintain improved facilities and standards on their beach and are a key factor for the successful development of a destination especially because tourists are well aware of these ratings and will favor a destination that is highly rated and awarded. There are a number of management models and award system models that provide stringent management guidelines that should be adhered to. Some of these are mentioned below with the most appropriate recommended for management of Rubavu Public Beach.

5.3.1. Bathing Area Management Model

The Bathing Area Management Model (BAM) is was developed by Micallef (2003) as a management tool related in particular to any proposed management plan for local bathing areas, but also applicable to







coastal area management plans in general. This model consists of seven main phases: data gathering, policy definition, planning, implementation, analysis, evaluation and review, and monitoring/control. The different phases involve identification of national policy related to bathing area, development of beach management plans based on the set policies and objectives adopted, collection of information of the beach and the surrounding areas that is visible from the beach and within walking distance of the beach and analysing this information to identify the priority management actions required to improve the beach facility and finally the development of a monitoring and evaluation procedure that is able to mitigate on any challenges in a timely manner.

5.3.2. Management Guidelines Model

Based on currently adopted principles of integrated coastal and shoreline management plans, beach management guidelines are confirmed as an effective beach management model (Grigalunas and Congar 1995). The application of guidelines as a management model is a comprehensive approach that involves the identification of the issue and application of relevant strategies to mitigate these issues. In implementing these strategies, it is noted that different management strategies should be considered for different beach types rather than taking a blanket management approach (Schembri and Lanfranco 1994). The guidelines will include the following:

	Issue	Recommended Strategy	
1	Bathing area carrying capacity	A minimum of approximate 6m² of beach space per user.	
2	Zone allocation	 Separate swimming area from boating and water sports using lines with marker buoys. Zone and separate different activities on the beach 	
3	Access	 Provide adequate parking facilities not further than 500m. Public access should be facilitated by sign posted footpaths 	
4	Toilets and Showers Changing rooms	 Adequate numbers to be provided according to the zones activity Permanent toilets linked to the main sewerage system are recommended 	
5	Beach Cleaning	 Adequate and appropriate beach cleaning services should be provided. 	
6	Litter Bins	 A minimum of one bin per 150 beach Bins must have covers to minimize insect nuisance and health hazards. Bins must be regularly emptied 	
7	Hazardous Items	Glass and other potentially hazardous material banned	
8	By Laws	 By-laws should address all issues of concern on the beach including noise, unpleasant behavior, fires or littering 	
9	Life Guards	 Well trained life guards spread out appropriately. Blue Flag guidelines recommend a minimum of two lifeguards at intervals of 200m 	
10	Patrol Towers	Patrol Towers placed at the centre of the bathing area	
11	Public Rescue Facilities	 Ring buoys should be available having at least 30 meter of throw-line and being no more than 100 meters apart. 	
12	Monitoring	 A long-term monitoring programme related to baseline studies should be implemented to detect early signs of environmental change. 	

5.3.3. Blue Flag Beach Management

The Blue Flag is operated under the auspices of the Foundation for Environmental Education and is headquartered in Copenhagen, Denmark and is probably the most internationally recognized beach award system. The award system is based on compliance to 32 criterion which encourage the sustainable development of beaches by ensuring the implementation of high standards of products and services offered on the beach. In Africa Blue Flag status has been awarded to beaches in South Africa and in Morocco. The Blue Flag award requires the applicant to achieve high standards in four main







criteria, namely: Environmental Management, Environmental Education and Information, Safety and Services and Water Quality.

5.3.3.1. Blue Wave Management

The Blue Wave of the Clean Beaches Council is America's first environmental certification for beaches, with 33 assessed criteria for resort beaches. Focus is given to the water quality, physical condition of the beach, services offered, conservation measures, public education and management of the ecosystem.

5.3.3.2. Bathing Area Registration and Evaluation

The Bathing Area Registration and Evaluation System (BARE) evaluates the beach area as a whole including the surrounding or neighboring area that is visible from the beach and all the users of the beach facilities. The BARE system evaluates 5 main parameters in order of priority starting with safety; water quality; facilities; scenery and litter. The main aim of the BARE technique is to improve beach quality through effective beach management The technique provides local authorities with a tool to better assess the quality of their beaches, helps beach managers to develop more site-specific and therefore effective management plans and gives an opportunity to beach users to make a better-informed choice of bathing areas.

5.3.3.3. Beach Registration Management System

A beach register is a checklist that has been developed to assist beach managers in the efficient management of the beach resources. The check list covers different categories including:

- Description of the Beach: area of the beach described as length and width; beach material including sand, gravel, mud, etc; assessment of litter per day; and number of visitors per day during the peak times
- ❖ Description of the surroundings Beach environment: Accessibility roads, public transport, absence of public transport; River outlets and streams; Facilities (Restaurants, hotels, bars, toilets, litter bins parking, information signage).
- ❖ Description of Swimming Environment: Water quality; Usage water sports, and swimming, diving. Beaches that have utilized the beach registration as a management model include the Brighton beach in the United Kingdom and Mhlathuze beaches in South Africa.

5.3.4. Recommended Blue Flag Award Beach Management for Rubavu

Based on our research, professional advice and various other policy documents that have been developed we select the implementation of the Blue Flag Award System as the most appropriate beach management system for the Rubavu Public Beach. The Implementation Process of Blue Flag Award System will follow different steps. The first step of the implementation process is to make an official application to the Foundation for Environmental Education for requesting Rubavu Public Beach to be considered for Blue Flag status. However before the application is made, the Rubavu Public Beach must have put some requirements in place to attain eligibility status. A systematic process of application must therefore be put in place as below:

Step 1- Set up a Blue Flag Committee that will oversee the implementation process:

The Rubavu District will work in partnership with the private investor to set up a committee whose members will be composed of stakeholders representing different roles like water quality, Environmental bodies, Security, Tourism Organizations and Private sector representatives.

Step 2- Blue Flag initial Workshop: The district working in partnership with the Private Investor will organize a workshop to introduce the Blue Flag project to the stakeholders committee, solicit ownership and plan the way forward with each member provided with a role







<u>Step 3-</u> Feasibility Stage: The committee will examine the current condition of the Rubavu Public Beach and develop a plan of action for the implementation process. Main issues to be addressed at this stage will include the safety of beach users, accessibility and infrastructure, water quality, environmental education, waste management, recreational nature management and availability of tourism facilities.

<u>Step 4-</u> Blue Flag Pilot Phase: The pilot phase will be the period when different criteria are implemented to upgrade the Rubavu Public Beach to Blue Flag Status. Each committee stakeholders will be in charge of ensuring compliance in their areas of expertise.

Below is a list on the initial criteria to be adhered to during the pilot stage before an official application for Blue Flag status is made. The criterion below is adopted from the Blue Flag management system Source: https://www.blueflag.global/join).

- > Criterion 3: Information about bathing water quality must be displayed: Plans are underway to carry out water sampling tests of the Rubavu Public Beach water. The initial sampling will be carried out in the swimming area zone so as to ensure swimmers are safe from any water impurities. The information on the water quality will be displayed on a notice board right next to the swimming area.
- ➤ Criterion 5: A map of the beach indicating different facilities must be displayed: A map has been developed for the Rubavu Public Beach and the adjacent Avenue de la Cooperation which shows the beach boundaries, location of the different zones, the car park and the car free zone. This map will be displayed on the notice board at the entrance in order to guide the beach users on the location of different services and products. This includes location of the: Different zones and activities in each zone; toilets (including toilets for disabled people); car and bicycle parking areas; access points and access for disabled persons; Car Park and the Bicycle Park; Bus Stops and nearby public transport; lifeguards and lifesaving equipment; and first aid equipment. The map will be displayed in different locations on the beach including the entrance, on each zone and on the Avenue de la Cooperation.
- Criterion 6: A code of conduct that reflects appropriate laws and/or regulations governing the use of the beach and surrounding areas must be displayed: Rubavu Public Beach will offer different, services and products for the different users and each zone will cater for a different target group. In the same way Avenue de la Cooperation will offer a number of different services and there will be a mixture of users. It will be therefore very vital to develop some rules and regulations on the use of each zone. A cone of conduct will be put in place to address the activities of beach users and their conduct on the beach and it will be displayed on the information board on the beach, at a strategic place on Avenue de la Cooperation and at all major entrance points. To ensure the message is receives by a wide audience; the Code of conduct will be in Three Languages, Kinyarwanda, English and French.
- Criterion 15: The beach must be clean: The Private Manager of the Rubavu Public Beach will work in partnership with the Rubavu district to ensure that the beach, Avenue de la Cooperation, the car and bicycle parks; and the surrounding areas are continuously kept clean, litter is collected daily, and all areas are well lit and in good order. The main task of cleaning the beach will be assigned to the Rubavu District and the specific details will be agreed upon in a duly signed management agreement.







- Criterion 17: Waste disposal bins/containers must be available at the beach in adequate numbers, and they must be regularly maintained: The Rubavu District in partnership with the private investor will be mandated to ensure cleanliness of the Beach and they will ensure that there are an adequate number of bins place in different locations of the beach. The bins will be well maintained, emptied and cleaned regularly to prevent any odors or unhygienic conditions.
- ➤ Criterion 19: An adequate number of toilet or restroom facilities must be provided: It is proposed that each zone will have a different number of toilet facilities depending on the activity to be carried out and the average number of users during the peak season. For example the zone for events will have more toilets than the zone for swimmers or the zone for children. Location of all toilets will be well displayed by use of signage.
- > Criterion 20: The toilet or restroom facilities must be kept clean: Cleaning of the toilet facilities will be under the management of the Private Investor. They will ensure adequate well trained staff to clean the toilets often and on a regular basis depending on the usage. All toilets will be inspected by a supervisor on a regular basis to ensure standards are well maintained
- ➤ Criterion 27: Appropriate public safety control measures must be implemented: Rubavu Public Beach will have different users all confined within a limited space and public safety measures must be put in place to ensure control. There must therefore be adequate guards and lifeguards patrolling and place at appropriate intervals. To ensure the life guards are easily identified, it is recommended that wear the internationally recognized red/yellow uniform and they must have adequate lifesaving equipment.
- > Criterion 28: First aid equipment must be available on the beach: The first aid may be available by means of: a) a lifeguard on-site, and/or b) an attended first aid station with trained personnel, and/or c) equipment located in a shop or other beach facility at the beach, and/or d) directly available to the public on the beach.
- ➤ Criterion 33: Have access and facilities provided for the physically disabled: Access for disability will be catered for on the Rubavu Public Beach. This will include access ramps and wheelchair access designed for users with various disabilities. There will also be designated parking for the disabled parking which will be in close proximity to the Rubavu Beach Entrance.

Step 5-_Application for Blue Flag Award: After having implemented the above, it will be possible to make an application for full Blue Flag award for the Rubavu Public Beach.

5.3.5. Case Study: South African Beaches

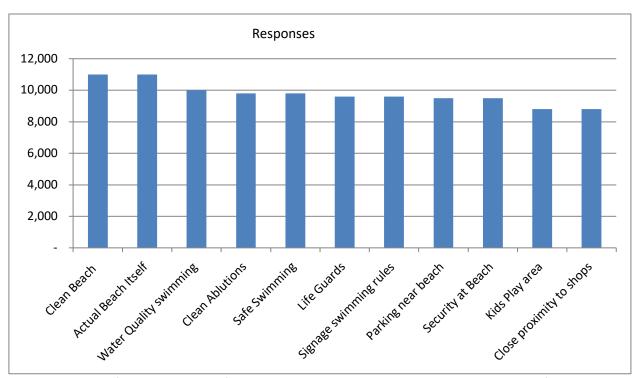
Study on South African Beaches using Blue Flag as Management System

This case study is based on a research carried out on the Perceptions and Activity Profiles of Blue Flag Beach users in South Africa (Slater and Mearns 2018). According to Slater and Mearns (2018), the main issue preventing beach owners from implementing the Blue Flag programme are the high administrative and maintenance costs, high cost of implementation and the difficulty of achieving the stringent water quality standards The research aim was to: better understand the reasons why beach users select beaches with blue flag status, and the beach user preferences so as to provide for them more efficiently. The categories studied included the signage, water quality, availability of life guards, availability of security, clean beach, safe swimming conditions, and availability of parking, close to shops and services, Kids play area, actual beach itself (sense of place).

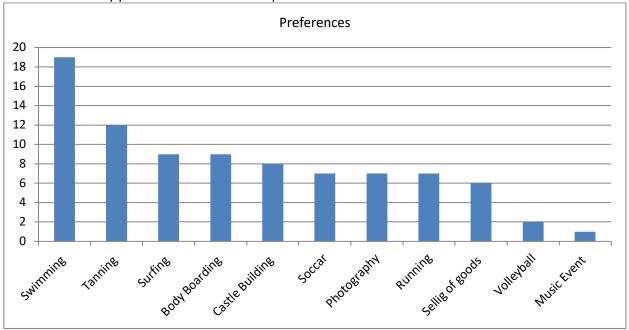








The top three preferences received from the beach users on the Western Cape in order of priority were: Clean beach, Actual beach itself (sense of place), and Water quality. The least preferences were the Proximity to shops, Kids play area, and Parking near the beach. The study was also carried out on the beach user activity profiles on the Eastern Cape beaches.



From the survey carried out the most popular activities observed in order of priority are: Swimming, Tanning, and Surfing. The result of the surveys indicates that Beach user preferences can be directly linked to the Blue Flag beaches which have become synonymous with quality.







Source:

https://www.researchgate.net/publication/328277083 Perceptions and activity profiles of Blue Flag beach users in Sout h Africa/link/5bc3718e299bf1004c5f361f/download







6. MARKET ANALYSES

6.1. Overview of Tourism on Rubavu District

Prior to the global Covid-19 pandemic Rubavu Public Beach was known as a weekend gateway for many categories of domestic, regional and International visitors in Rwanda. The domestic visitors were looking for an escape from their usual settings to a destination that was able to offer unique leisure and entertainment facilities. This group included the families, student groups, organized groups from world and the business and expatriate community working in Kigali and other parts of the country.

6.1.1. Regional Tourism and Target Marketing

The regional visitors included the residents of the neighboring Goma city in the Eastern Democratic Republic of Congo who were a major source for Rubavu Public Beach and the visitors from the East African community. In the year 2018 the total visitor arrivals to Rwanda from DRC was 744,767 and from this number 136,398 visited Rubavu district. In 2019 there were 762,305 visitors from DRC and from this number a total of 147.802 visited Rubavu. In the year 2018 the total visitor arrivals from EAC was 678,595 visitors and out of these 25,741 visited Rubavu District. In 2019 there were a total of 581,487 visitors to Rwanda and of these 21,640 visited Rubavu District.

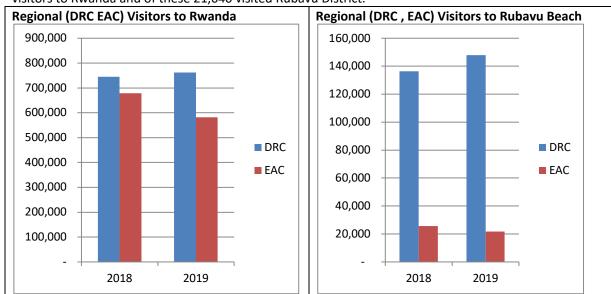


Figure 26: Regional visitors to Rwanda and to Rubavu Beach

From the above figures, it is evident that there is big potential to be targeted from the regional market. In both the years 2018 and 2019 there is 81% of the visitors to Rwanda who have not visited Rubavu District. This is a good market potential and they need to be approached by way of marketing strategies, promotional events and advertising.

6.1.2. International Visitors to Rwanda

The international tourist mostly comprised of the visitors from key source markets from Asia, Europe and North America who mainly visit Rwanda for Business, Conference, Holidays, Missions, or to visit friends and relatives and visit the national parks. International visitors who visit Rwanda for Holidays will often visit the Volcanoes National Park then include the Rubavu as part of their itinerary before proceeding on to Nyungwe National Park and other destinations.

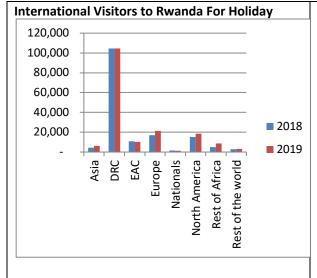






International V	International Visitors to Rwanda for Holidays		
Region	2018	2019	
Asia	4,303	6,255	
DRC	104,408	104,521	
EAC	10,789	10,079	
Europe	17,133	21,228	
Nationals	1,666	1,305	
North		18,592	
America	15,088		
Rest of Africa	5,020	8,717	
Rest World	2,958	3,222	
TOTAL	161,365	173,919	

International Visitors to Rubavu District			
Region	2018	2019	
Asia	2,773	4,058	
DRC	136,398	147,802	
EAC	25,741	21,640	
Europe	11,459	12,208	
North	5,052	5,629	
America			
Rest Africa	44,751	41,987	
Rest World	1,414	1,389	
TOTAL	227,587	234,712	



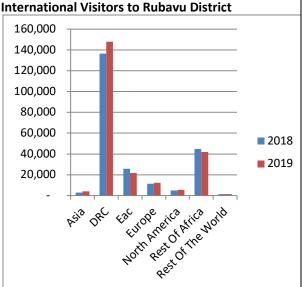


Figure 27: Visitors to Rwanda /Rubavu for Holiday Purpose

In 2018 there were a total of 161,365 visitors to Rwanda from the key source markets whose purpose of visit was holiday. In 2018 there were a total of 227,587 visitors to Rubavu district. In the year 2019, there were a total of 173,919 visitors to Rwanda from the key source markets for holiday purposes. In 2019 there were a total of 234,717 visitors to Rubavu district.

6.2. Marketing Process

Our marketing process will embrace a Product Development strategy that aims to embrace the key components that influence the visitor decision in choosing Rubavu Public Beach and Avenue de la Cooperation as a the preferred tourism destinations. These components are all intertwined and must be well managed to ensure a wholesome and excellent visitor experience. The components range from the Tourism Product, Attractions, Accommodation, Amenities and Ancillary Services. To ensure the success of each component, we will work in close collaboration with the stakeholders who each play an important role and provide a different service or product that contributes to the wholesome quality of the Rubavu Public Beach.







6.3. Product

The two main products to be promoted are the Rubavu Public Beach currently under the management of the Rubavu District and the Avenue de la Cooperation which is a public road. The Beach is 143 Km from Kigali and is accessible via a well graded tarmac road. To travel to Rubavu, visitors can use public transportation buses which leave Kigali at scheduled times and take about 4 hours to get to the Rubavu due to drop offs along the way. By private drive it takes about 3 hours. The road is in excellent condition with a beautiful winding landscape which is excellent for viewing and picture taking.

6.4. Tourism Attractions in Rubavu

The ideal location of Rubavu city on the shores of Lake Kivu, next to the rich DRC border city of Goma and within close proximity to the Volcanoes National Park enhances Rubavu's ability to provide a diversified range of tourism products and attractions. Currently there are a variety of attractions which all contribute to making Rubavu a popular destination. These include:

6.4.1. Lake Kivu

Lake Kivu located between DRC in the west and Rwanda in the East lies at 1460 meters above sea level and occupies 1040 square miles long from the north to south and 30 miles width east to west. It is reputed to be Africa's deepest fresh water lake at 1558 feet with deep clean water that is perfect for swimming, recreational sports or just plan relaxation. Specific activities on the Lake include Kayaking, Canoeing and Night fishing.

6.4.2. Islands on Lake Kivu

There are several small islands on Lake Kivu with each offering unique attractions and adventures. One of the most popular is the Napoleon Island where one can explore the huge colonies of straw —colored fruit bats with thousands of the bats hanging in trees and sleeping during the day then spreading out into the dark once the night time falls. Another popular Island is the Monkey Island which as the name suggests houses groups of monkey families swinging from tree to tree and the Peace Island which is home to a rich birdlife. The local boat owners in partnership with the more established tour operators are available on the beach to provide an adventurous ride to these islands.

6.4.3. Rubavu Hot Springs

Nyamyumba hot springs are located along the eastern shore of Lake Kivu and near BRALIRWA (Nshimyumuremyi 2014). The Kivu Belt Sub-Master Plan proposed the development of Hot Springs Resort at Nyamyumba in Rubavu District. The geothermal fluid of Gisenyi hot spring flows towards the Kivu Lake, where the community enjoys the hot water which boils at surface water temperature of up to about 70 to 75°C, the Gisenyi hot spring is an active geothermal manifestation.

6.4.4. Congo-Nile Trail / Pfunda Tea Trail

The Congo-Nile Trail is an off road facility for walking or cycling stretching over a 227 km along the shores of Lake Kivu in the western province and passing through Rubavu, Rutsiro, Karongi, Nyamasheke and Rusizi districts. The Pfunda Tea Trail is a sub-trail of the Congo Nile Trail. It offers a unique tea experience with a combination of community tea plantations, the factory tour and tea tasting. The trail starts in Rubavu District and ends on the edge of the Gishwati Forest within Rutsiro District.

6.4.5. Brewery and Beverage Company of BRALIRWA

BRALIRWA is the oldest and largest Brewery and Beverage Company which is located Rubavu Secondary in Rwanda. It produces several local beers like Primus and Mutzing, as well as international brands like as Amstel, Guinness and a range of soft drinks. Bralirwa brewery is located at the shore of Lake Kivu.







6.5. Proposed New Attractions on Rubavu Public Beach

The development of Rubavu Public Beach and Avenue de la Cooperation will introduce a number of new and exciting tourism products in Rubavu. The overall objective is to add value to the visitor experience in order to encourage more time spent in Rubavu. This all transacts into more revenue to the district, the private investor and the local community who are all providing different services to the visitors. On the beach it there will be different activities and products which will be restricted to different zones and locations.

6.5.1. Events Area

This will be a well-managed space which can be hired out for different events and functions. The green areas will be well manicured with adequate trees and flora to enhance site into a photographic and beautiful scene. The event zone will be well serviced with adequate washrooms and toilets which will be professionally managed to impeccable standards. There will be a docking area conveniently place at the shoreline of the event area so that guests arriving by boat can easily board and disembark from the boats.

6.5.2. Childrens Park Zone

Our target groups include families with young children of different ages. There will therefore be different games and activates to suit different age groups on the children's zone. To ensure parents are also able to enjoy themselves, there will be professionally trained personnel to provide children mining services so that parents can have some quality time resting. The children's zone will be well serviced with adequate washrooms and toilets suitable for use by different age groups.

6.5.3. Swimming Area

The swimming area will be enhanced with a beautiful water slide, beach beds and umbrellas. The relaxation of the visitor will be the key guiding factor in setting up the swimming area. This being a swimming area, key attention will be given to the changing rooms and toilets to ensure they are adequate to cater for big crowds and well managed to ensure cleanliness.

6.5.4. Shopping on Avenue de la Cooperative

Avenue de la Cooperation will be converted into a car free zone and will offer an interesting shopping experience to visitors. The variety of small shops along the road will include curios, art and artifacts, fast food, snacks and refreshments.

6.6. Accommodation

Rubavu Town has got a wide selection of good hotels ranging from 4 stars to 1 star rating. In total there are two 4 star hotels, five 3 star hotels, eleven 2 star hotels and forty eight 1 star hotels. The key hotels near the Rubavu Beach and "Avenue de la Cooperation" include the Kivu Serena rated at 4 star, Hillview Hotel and Gorilla Hotel. Other licensed accommodation in the district include the following.

Table 11: licensed accommodations in Rubavu

	Hotel Name	Туре	Rooms
1	Kivu Paradise Hotel	Vacation Hotel Or Resort	10
2	Havana Guest House and Apartment	Vacation Hotel or Resort	30
3	Inzu Lodge	Vacation Hotel or Resort	8
4	The Palm Beach Resort	Vacation Hotel or Resort	18
5	Belvedere Hotel	Town Hotel	25
6	Centre d'Accueil Saint Francois Xavier Ltd	Town Hotel	30







7	Fanad Guest House	Town Hotel	20
8	Kivu Peace View Hotel	Town Hotel	50
9	Mostej Hotel	Town Hotel	19
10	Musanto Hotel	Town Hotel	23
11	Ubumwe Hotel	Town Hotel	25
12	Western Mountain Hotel	Town Hotel	40
13	Best Choice Guest House Ltd	Lodge	50
14	Guest House Happy Garden	Lodge	11
15	Iwacu Sunset Land Guest House	Lodge	15
16	Rubavu Hakuna Matata 2 Ltd	Lodge	16
17	Umucyo Christian Guest House	Serviced Apartment	20
18	La Charite Guest House	Villa	18
19	La Serenite Guest House Limited	Villa	9
20	Reward Guest Rooms Limited	Villa	11
21	Shadow House	Villa	8
22	Valley Guest House Limited	Villa	16
23	Beach Garden BnB Ltd	Motel	13
24	Blessington Motel	Motel	14
25	Light Guest House & Apartment Ltd	Motel	18
26	New Garden Guest House Ltd	Motel	10
	Total room capacity		527

6.7. Amenities

The amenities of a tourism destination play an vital in enhancing the visitor experience, encouraging return visits and positive word of mouth recommendations to family, friends and collogues. Rubavu Public Beach and "Avenue De La Cooperation" must ensure that there are adequate amenities that will help the different visitors feel comfortable and secure. Amenities to be provided will therefore be the following

- Visitor Center located at the entrance point which will have a registration desk to register business people on beach (e.g. boat owners curio sellers); a First Aid Desk providing emergency medical services; and Booking services on beach like private swimming instructors and child minders
- Shops hired out to private business to offer the following services and products: Ice cream parlor; Beverages – Drinks, Coffee, Tea; Gift Shop; and Shop selling curios and Rwandan artifacts
- Well-lit Parking Area
- Well-lit Bicycle Rack parking
- Rump for Disability access
- Public toilets and showers located in each zone for easy access
- ❖ Adequate Signage directing visitors and providing information















- Well paved sidewalk along Avenue de la Cooperation for walking.
- ❖ An attractive, user-friendly, easily navigable website providing adequate information.

6.8. Stakeholder Collaboration

It will not be possible to provide all these services and amenities without the support of local authorities and other stakeholders. Rubavu district is the local governance entity in charge of overseeing different activities in the district for the sustainability of its socio-economic development. Tourism is one of the main activities benefiting the district in that regard. The vibrancy of tourism in Rubavu is the result of synchronized contributions by different stakeholders. The following list identifies some of the stakeholders for Rubavu Public Beach.

Table 12: stakeholders for Rubavu Public Beach Management

Cat	tegory	Entities	Inv	rolvement
1.	Owner of Rubavu Public Beach	Rubavu district	•	Owner and overseer of Rubavu Public Beach Ensure local infrastructure Stakeholder engagement Implementation of national regulations
2.	Local Government Administration	Gisenyi sector Nengo cell Gikarani neighborhood	•	From the sector to the neighborhood level, local governance helps in daily update of what is happening at the beach and report to Rubavu district accordingly
3.	Public institutions	RDB (Rwanda Development Board) • Destination marketing for Rubavu • Investment promotion of Kivu Public Beach • Tourism regulation of different aspects of Kivu Beach		_
		Rwanda Transport Development Agency (RTDA) Road Maintenance Fund (RMF)	•	Validation and modification of transformation of Avenue de la Cooperation Public bus stops on RN4 Rubavu bus terminal around RN4 Possible need of expansion of RN4
		Rwanda Environment Management Authority (REMA)	vironment • Guiding on compliance with guidelines for	
		Rwanda Land Management and Use Authority • Guiding on compliance with the Rubavu City		Guiding on compliance with the Rubavu City masterplan
		Rwanda Utilities Regulatory Authority (RURA)	•	Guiding on compliance with the boundaries of Kivu beach Guiding on compliance with the environmental impact assessment requirements
		Rwanda Mines,	•	As an authority operating in Kivu Lake, to be aware of the







		Petroleum and Gas	Rubavu Public Beach development	
		Board (RMB)		
		Rwanda Water	As an authority in charge of water resource, to be aware of	
		Resource Board (RWB)	the Rubavu Public Beach development	
		Water and Sanitation	As an authority in charge of providing water and solid	
		Corporation	waste management.	
		Rwanda Defense Force	Awareness on Rubavu Public Beach activities	
		(RDF)'s Marine Unit	Rescue intervention	
		Directorate-General of	Awareness of RDC target market	
		Immigration and	Facilitation with inter-border crossing for tourism on	
		Emigration, Rubavu	Rubavu beach	
		borders	Facilitation with water boats crossing for tourism on	
			Rubavu beach	
4.	Private Sector	Private Sector	Awareness and possible support to identify and attract	
	Federation (PSF)	Federation (PSF)	potential investors	
5.	Kivu beach	Lake Kivu Serna Hotel,	Awareness and inputs on the project	
	neighboring	Hill View Hotel, Gorillas	Priority for exploitation of their respective beach front	
	community	Lake Kivu Hotel		
6.	Service	Service providers on	Boat operators: Grouped under an association, to provide	
	providers on	Rubavu Public Beach	inputs and to anticipate improved ways of working once	
	Rubavu Public		the beach is operational	
	Beach			
			Local tour operators involved in giving inputs on the Rubavu	
			Public Beach	
			They are the ones who will package the different services and	
			activities once the beach is operational	
7.	Other users of	Users of the boat dock	Still to be identified.	
	the beach	(Big boats to Iwawa and	Rubavu district can assist to identify them for consultation	
1		other destinations)		

6.9. Role of tour operators

A well-managed marketing channel for the Rubavu Public Beach and the "Avenue de la Cooperation" as tourism product is essential to ensure that the key targeted markets are reached leading to increased tourism numbers. To ensure efficiency it is proposed that a partnership is made with the local and international tour operators to aggressively market the place to potential visitors. The main tour operators based in Rubavu include the following:

Table 13: Tour operators based in Rubavu

1	Ames Tours	https://amestours.com/
2	Green Hills Eco Tours	http://www.greenhillsecotours.com/
3	Kingfisher Journeys	https://www.kingfisherjourneys.com/
4	Lava Bike Tours	https://lavabiketours.com/
5	Go Gisenyi Tours	https://gogisenyi.wordpress.com/
6	Ask 4 Adventures	https://ask4adventure.com/
7	Beyond Kigali City Tours	https://www.beyondkigalitours.com/
8	Country Side Tours Rwanda	https://www.countrysidetoursrwanda.com/
9	Rwanda Eco Company & Safaris	https://rwandaecocompany.com/
10	Ikaze Rwanda Tours	https://ikazerwandatours.com/
11	New Dawn Associates	http://www.newdawnassociates.com/
12	Rwandan Adventures	http://www.rwandan-adventures.com/







Source: https://kivubelt.travel/book-the-kivu-belt-with-a-tour-operator/

6.10. Pricing

Rubavu Beach is a public beach and will be open to be accessed by the public free of charge. The pricing will however be set on the products and services provided both on the beach and on Avenue de la Cooperation. Different areas of pricing will be as below:

	1 0	
	Pricing	Unit Cost
1	Hiring of Event Area for function per day	1,500,000
2	Hiring Sports Zone per day	1,000,000
3	Entrance Fee for Childrens park per child	10,000
4	Entrance fee to Swimming area per person	10,000
5	Hiring out shops to business people per month	700,000
6	Hiring out Car Park/visitor center	700,000

The pricing of the above facilities is based on competition oriented pricing from the region in Rwanda, Uganda and Kenya. The pricing is profit oriented aimed at profit maximization and returns on investments.







7. COSTS, BENEFITS AND CARRYING CAPACITY OF RUBAVU PUBLIC BEACH 7.1. Cost Benefit Analysis

Cost-benefit analysis (CBA) is a form an economic appraisal to estimate changes to the economic wellbeing of local and wider communities. A CBA is used to estimate and compare the costs and benefits of implementing a proposed project or management activities associated with beach development and use. The focus will be put on economic, social, and environmental dimensions of the beach area.

7.1.1. Economic dimension

Economic Costs Economic Benefits The support infrastructure required to Increased visitor number provides the local support the increased numbers and authority with extra tax revenues converting Avenue de la Cooperation will There will be an increase in both local jobs and cost the local authority a substantial business opportunities like tour operators, tour guides, food production, accommodation amount of money e.g. expanding the roads facilities The developed beach it international The multiplier effect will take place when the standards may lead to an inflation on the visitors bring new money into the economy of neighboring community property values Rubavu district The seasonal nature of tourism will lead to Tourism is a labor intensive sector and the unstable employment conditions high season there will be massive employment The local community may lack the opportunities. Is labor-intensive. international skills to be employed The local authority will be able to earn the therefore leading to an influx of foreign valuable foreign currency from the visitors employees earning much higher salaries

7.1.2. Social dimension	
Social Costs	Social Benefits
 Development of Rubavu Public Beach will attract various categories of visitors whose lifestyles and ideas and culture may conflict with the local community lifestyle e.g. use of drugs and alcohol. The increased number of visitors may result in crowding and congestion both on the beach and the surrounding areas. Crowding may lead to competition for the limited resources between the local community and the visitors. The converting of "Avenue de la Cooperation" into a car free zone reduces the public space and may cause conflict 	 Increased visitors automatically leads to an increase in the money which is used to support the community facilities, infrastructure and services that otherwise might not be developed. The visitors' presence provides an opportunity for the local community to showcase its local culture and a cultural exchange with the visitors. The new facilities and infrastructure developed for tourism and recreation can also benefit the local community. There may be a loss of traditional Rwandan values and culture through imitation of visitor behavior or cultural. Commercializing "Avenue de la Cooperation" will provide the local community with extra source of income and employment opportunities.







7.1.3. Environmental dimension

Environmental Costs	Environmental Benefits
 Development of Rubavu Beach may lead to a loss of the natural vegetation and corrosion of the shoreline; Increased visitors may lead to an increase in littering noise and pollution. There will be an increased demand on the limited resources such as water and land, resulting in land degradation, loss of habitats and deterioration of scenery. 	Visitors are more attracted to destinations with a well preserved environment. Increase numbers will therefore lead to increase efforts to

7.2. Benefits to Surrounding Hotels

The hotels that border the Rubavu Pubic Beach are the Kivu Serena, Hillview and the Gorilla Hotel. It is proposed that they are encouraged to hire one of the shops on Avenue dela Cooperation and fully brand the shops then extend their services to the beach.

7.3. Carrying Capacity of Rubavu Public Beach

According to McNeely and Thorsell (1987) carrying capacity is the maximum level of visitor use that an area can accommodate with high levels of visitors' satisfaction and few negative impacts on resources. The UNWTO defines the Tourism carrying capacity of a destination as "the maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, and socio-cultural environment and an unacceptable decrease in the quality. Middleton and Hawkins (1997) defined Tourism Carrying Capacity as the level of human activity an area can accommodate without the area deteriorating, the resident community being adversely affected or the quality of visitors experience declining. According to Kurhade (2013), there are a number of different forms of carrying capacity referred to in tourism which include the physical carrying capacity, social biophysical carrying capacity, environmental carrying capacity, psychological (conceptual) carrying capacity and the tourism carrying capacity. The control and monitoring of the carrying capacity on Rubavu Public Beach must be well coordinated right from initial development and all through the project life. To achieve this in a sustainable manner, it is recommended that the management of the carrying capacity is undertaken by a committee, whose members will be the Private Investor, Rubavu District, representatives from the neighboring hotels and REMA. The committee will function under the supervision of REMA who will provide leadership and guidance on the number of tourists that can be accommodated on each zone before some negative impacts occur and how much tourism activity is acceptable before there is a decline in visitor satisfaction. The Monitoring process will be based on the different carrying capacities as below:

- Physical carrying capacity: This is the maximum number of visitors that a tourist attraction is able to
 support and the Rubavu Beach committee can use it as a management tool to define the threshold
 beyond which environmental changes, disturbance and problems occur. Each zone on the Beach will
 have a different physical carrying capacity depending on the Size of the zone, number of visitors that
 can be comfortably accommodated, availability of adequate facilities like seating, toilets and general
 personal space which according to Mowforth and Munt (2015) is 1meter spacing for each person.
- **Social carrying capacity:** This relates to the negative socio-cultural impacts associated with tourism development. The indicators of when the social carrying capacity has been exceeded are a reduced







local tolerance for tourism activities, reduced visitor enjoyment and increase in crime and hostility from the local community. Members of the committee are always on the ground both on the ground and within Rubavu district and they will able to closely monitor any changes in social behavior and attitudes.

- The economic carrying capacity: It relates to the level of acceptable change within the local economy of a tourist destination. This will be the extent to which Rubavu Public Beach and Avenue de la Cooperation are able to accommodate the different tourist functions without causing the loss of activities offered by the locals. In as much as possible, the Rubavu Beach Management Committee will involve the local community in the income earning activities like boat riding, photography, night fishing and tour guiding services.
- The *biophysical carrying capacity:* It deals with the extent to which the natural environment is able to tolerate interference from tourists. For the Rubavu Beach the Committee will be monitoring each zone to ascertain the limit where the damage exceeds the beaches ability to regenerate.
- *The environmental carrying capacity* refers to ecological and physical parameters, capacity of resources, ecosystems and infrastructure.
- **Ecological carrying capacity:** This is a measure of the population that an ecosystem can sustain, defined by the population density beyond which the mortality rate for the species becomes greater than the birth rate.







8. "AVENUE DE LA COOPERATION": CAR FREE PROMENADE AREA

8.1. Location

The palm-lined Cooperation Street or "Avenue De La Cooperation", is located next to Rubavu Public Beach. It is a popular recreational area for local populations and visitors to Rubavu City. This street has the potential to develop into an attractive pedestrian zone with cafes, shops, and other related tourism services. This would improve the attractiveness of the area and of Rubavu City as the main tourism destination (Jeong 2018). The Cooperation Street itself has a unique character that should be protected, planned and promoted as a pedestrian dominated tourism attraction with encouragement and guidance given to property owners to upgrade the properties.



Figure 28: Avenue de la Cooperation Zone

The area should therefore be zoned for conservation and developed with care and promoted as a tourism destination targeted to the family market, offering simple luxury with good service and quality. Access to Rubavu Public Beach is generally through the "Avenue de la Cooperation". Pedestrians and Bicycle riders can easily access the beach through the Avenue de la Cooperation however when using public transport there is a distance from the drop off bus stop. Private vehicles can easily access the Beach however there is the challenge of parking and security. Efforts should therefore be made to encourage visitors to walk to the beach or to access the beach by means of bicycle riding or walking. It is also important that the beach access caters for all users including the disabled users who currently do not have specialized access onto the beach or into the Lake Kivu. Provision must therefore be made to have disability reserved parking space and disability romps to facilitate easy access both to the beach and while on the beach.







Opportunities and Strengths of Avenue de la Cooperation

The opportunities and strengths for "Avenue de la Cooperation" is evaluated based on social, economic, environmental, physical form, land use, transportation and accessibility criteria s presented in the table below:

Ор	Opportunities		is	Criteria
-	New possibilities to decrease the environment pollution; Attractive environment for promoting tourism activities.	stre Exis prov	uced air polluted systems along the ets; tence of old and high palm trees that vide shade; ironmentally supporting area for ertainment and tourism activities.	Environment
-	Possibility for using historical elements for tourism promotion; Protection and conservation of buildings by changing their use.	LocalappOne	ery flat terrain which is suitable for an development ated near the Kivu Lake and the most reciated beach in Rwanda; of the historical sites of within Rubavu andary City.	Physical form
•	Cultural and social background for restoration and revitalization of the areas; Possibility to amplify social interactions.		ellings of the commercial employers ted in that area	Social
	Increased hotels and tourism activities. Possibility to combine the cultural and historical structures Possibility to create attractive activities like restaurant, coffee shops, ice-cream shops. Possibility for increasing the economic benefits	incr activ • An inclu	ation near the public beach leads to eased tourism and recreational vities increase in auxiliary service providers uding commercial banks, hotels, tour rators	Economic
•	Vacant and undeveloped land for hotels construction and recreation projects. Possibility to upgrade some buildings, functionalities and land use and transforming them to tourism facilities		ng zoned for commercial, tourism and eation near Rubavu Public Beach.	Land use
•	Facilitation of person's accessibility to parking lots in the surrounding areas. Suitable designing of limited entrances of the city connection with main streets.	External RubThe mode	icient road networks for accessibility. ensive path network on most streets of avu City. easy access to public transportation des like: bus, taxi and Motor taxis	Transport and Accessibility

Despite the above opportunities and strengths that will be achieved when Avenue de la Cooperation is converted into a car free zone, there are some vital challenges which must be adequately addressed in order to ensure sustainable development. These challenges are the lack of a network of wide shared paths with improved amenity to support higher pedestrian volumes; access roads lacking sufficient safe crossing infrastructure; narrowed access streets which will be reduced due to the pedestrian amenities, and insufficient street lighting for increased security on the Avenue de la Cooperation.

8.2. Need for pedestrian and car free street

While pedestrian paths are predominantly concerned with movement (mobility focus), the car-free areas stress higher level of social exchange (sociability focus). Car free areas are not only designed to provide for maximum movement of the pedestrians, but also create an environment that encourages







and enriches social interactions (Wright 2005). As such, the conversion of the "Avenue de la cooperation" into a pedestrian street and a car-free zone should consider the street not just as a piece of urban infrastructure, but rather a place for conversation, relaxation, thinking, playing, physical exercise and entertainment. The successful planning of the car-free zone as a social space will provide space, chairs and benches to facilitate a mood of relaxation and leisure while watching the beauty and the waves of the Kivu Lake. Visitors to Avenue de la Cooperation will have a variety of activities to partake in including shopping, cultural entertainment, or just easy relaxation on the seating facilities provided. The success of the car free street must provide a sense of safety, easy access for everybody including the disabled.

8.3. Modalities for Pedestrian Street

Excessive reliance on private cars, require usage of large span of available spaces to be used as parking and accessibility. This situation has led to many issues in urban area including congestion, safety, and environmental degradation. In order to solve these problems, the car free and walk able city concept is applied in many cities. The term car-free zone can encompass a range of different restrictions on motor vehicle use. Vehicle restrictions can be understood as a spectrum of possibilities from limiting the number of cars reaching an area to long-term absolute bans. On one side of this spectrum are areas that discourage vehicle use without an absolute use. Such areas are sometimes termed as traffic calmed areas or car-lit areas. In this case, cities permit full motorized vehicle access but discourage unregulated use and speeds through the road design. On the other side of the spectrum are cities that completely prohibit motorized vehicle. Motorized vehicles here do not include some personal mobility devices such as electric wheelchairs for the physical disability. However, scooters would be considered motorized vehicles that would probably not be allowed in strict car-free environment. In between, a traffic calmed area and a completely car free area is a range of possibilities varying by spatial and temporal nature of the vehicle restrictions. Rather than encompassing the entire surface of the city, a motorized vehicles ban may be limited to a particular area or zone. Vehicle restrictions may also vary by the time of the day, day of the week, and even the season of the year (Wright 2005). A car free shopping street refers to a pedestrian mall which focuses on commercial activity. In this area, motorized vehicles deliveries may still be allowed during off-peak hours (Patel, Gandhi and Bhatt 2016). Key considerations for converting existing an urban area into car-free zone include the following:

- Incentives to reduce car traffic: this measure is aiming at encouraging citizens to use public transport, bike or walk instead of using motorized vehicles. Private cars are not allowed to move directly from other zones to this car free street area. The drivers must go all the way out of the city, around the ring road, and then back into destination zone. Buses and cyclists can move freely to this areas.
- **Better public transport:** public transports should become a first-class service and serve citizens of all class from the society. It must be safe at night, operated by professionals, clean, reliable and in time.
- **Faster service**: service of public transport should be faster in most of the places, and more rapid within core city areas so as citizens and visitors choose public transport than private car.
- **Better biking and bicycling infrastructure**: All biking and bicycling infrastructure needs to be designed for specific requirements. For example, the sewer drains and inlets should not trap the wheels of a cycle. Potholes require fixture correctly and good cycle racks have to be provided.
- Increase density and reduce street width: to encourage high quality of public transport, it is necessary to increase the population densities near the public transport stops. Hence, buildings will have to be built multi-storied, and streets will have to be made narrower. These actions can increase enough the density while also releasing some land for green spaces (Patel *et al.* 2016).







8.4. Models for car free zone

Restrictive measures in car free areas are intended to discourage commuters from using cars (Loukopoulos 2007). They introduce restrictions on traffic or parking of vehicles like prohibition to enter by car to certain areas or streets, prohibition to park or limiting the number of parking spaces (Gärling and Loukopoulos 2007). They can be associated with fees for entering certain area or using certain elements of the transport network or car parking fees (Migliore, Burgio and Di Giovanna 2014). The implementation of these measures requires improvement of the travelling conditions for alternative transport means to cars, appropriate development of the car free areas for increasing the attractiveness of the area for pedestrians. In this line, the choice of local authorities and planners regarding the pedestrianisation of "Avenue de la Cooperation" and its conversion into car free promenade area may focused on cost-benefit analysis of three models for car free zone development which are: paid parking (pay as you park model), person vehicles ban model or all vehicles ban model (Kwik and Macfarlane 2014).

8.4.1. Paid parking

This model implements fees on cars that park inside a designated area where there is high demand for such parking spaces. This parking fee model should be based on the length of stay of the vehicle, and therefore discourages long-term parking. To work effectively, it requires monitoring and analysing the prices set by the local govern for curb parking area. The setting of the price influences how many cars will be willing to park in the area and in a given time. Having the price set too high, and too many drivers and visitors will be chased away by parking fees, damaging the local economy. Having the price set too low, and too high demand is generated, resulting in an overload of cars seeking a parking space while parking lots may be limited. This model is based on assumption that persons with more demand for a parking space are likely to be more advantageous for economic and social welfare. This model operates on the elimination of parkers who are likely to be contributing less to the economy in favor of those who are contributing more (Kwik and Macfarlane 2014).

8.4.2. Personal vehicles ban

This model only prohibits personal vehicles from entering the area, allowing public transportation such as busses and taxis to provide their services. Only busses and authorized vehicles, such as taxis or those delivering goods, are permitted to park on car free zone or car free street. Non-motorized transportation, such as bicycles, is also permitted to enter this area. As taxis or public transport cars are permitted to enter, those who have a high need to park within the car free area, due to physical status, time concerns, or personality, may still be able to pay for the convenience of being driven right to Rubavu public beach area. The efficient application of this model requires also an efficient alternative transportation mean. This model promotes a healthier environment, free of noise and air pollution, and provides a more hospitable place for pedestrians. Applying personal vehicles ban model however, induces massive costs in forms of lost welfare of both consumer surpluses for parking and paid benefits (Kwik and Macfarlane 2014).

8.4.3. All vehicles ban

The absolute vehicles ban model lies at the extreme of government intervention. It entails a complete prohibition of any vehicle into the area, including busses and other public transports. This model is enacted to protect a historic urban area, or to prevent vehicles from crowding or damaging traditionally narrow roads. Alternatively, this model can be applied only on certain days as part of a regular vehicle-free day to promote pedestrianism and pollution-free shopping (Kwik and Macfarlane 2014).







The absolute vehicles ban on car free street would hinder efforts of emergency vehicles to effectively, and rapidly, deal with issues that may arise: The larger concentration of persons within a car free area increases the chance that such vehicles may be needed. Transit from one side of the car free and pedestrian street to another side requires a complex route around the area, which is inefficient in terms of time, reducing utility of travelers, and will also increase air pollution due to the longer route that may be needed. The vulnerable persons such elder, young and disable people may have difficulties reaching the car-free and pedestrian street through physical exertion, whereas in the previous scheme a bus or taxi could have been a possibility. If the car-free street is long, the nightlife could be affected, as those who party may not delight the prospect of cycling or walking to home late at night, or even having to walk to the border of the zone to take a taxi. Adverse weather, especially during the rainy season could become an impending factor when deciding whether visitors to Rubavu Beach will go or not. A further ban to entry could affect commerce and the profitability of the businesses. Those shopping may be influenced to buy smaller quantities of items, as they are required to walk or cycle for some distance with them, at least until the edge of the car free street area (Kwik and Macfarlane 2014).

8.5. Pedestrian Street Model for "Avenue de la Cooperation"

As earlier mentioned, there are various reasons for having pedestrianisation schemes on "Avenue de la Cooperation". This pedestrianisation aims to provide better accessibility and mobility for pedestrians, to enhance the amount of shopping and other business activities in the area while improving the attractiveness of the local environment in terms of aesthetics, air pollution, noise and crashes involving motor vehicle with pedestrians (Chiquetto 1997). This pedestrianisation will create a pleasant environment that people can involve in different social, cultural, economic growth, and tourism activities (Iranmanesh 2008) of Rubavu District.

Rubavu Secondary City is striving to become one of best cities to visitor including those with disabilities, by offering convenient access to transportation and attractions. The City has set up the plan to provide various services for the disabled including ground transportation and wheelchair services. If the interstate buses (long-distance coaches) go to the terminal via the Gisenyi Public Beach, after then more visitors would be able to take a bus through *Ave de Independence and Avenue de Marche*, and arrive at the beautiful waterfront near the public beach. Since public parking lots are limited, it is important to consider ways to make it easier for more people to get to the beach by bus. Therefore, it is necessary to designate a temporary bus-stop around the public beach rather than expanding public parking lots.

Based on interview with the local community surrounding the Rubavu Public Beach and Avenue de la Cooperation, the most suitable and sustainable model for converting Avenue de la Cooperation into a car free zone is the part-time pedestrian street model. This model assumes that the "Avenue de la Cooperation" will allow for vehicles to use this pedestrian street to come to Rubavu Public Beach for a specific time. There will be no parking spaces for cars along the street or on the beach area, but loading bays are obtainable. Few members of the local community proposed also a full time pedestrian street model which states that all arrival of vehicles into street is fully forbidden and usually services are in the back of the street. In most cases, only emergency service vehicles will be allowed to enter.

8.6. Alternative Access to "Avenue de la Cooperation"

The pedistrianization of the "Avenue de la Cooperation" aims to redevelop a vehicle restricted area next to Rubavu Public Beach as a pedestrian corridor. The lack of reliable public transport to accommodate the expected number of visitors may be a critical factor to be addressed when pedestrianizing street. Consequently, providing many public transportation options supported by good infrastructure connecting the beach area to all parts of Rubavu City could minimize the private car dependency.







Pedestrians and cycling networks have to be sufficiently provided and well connected to public transport networks in order to promote walking and cycling. Improved accessibility and walkability can be achieved through creating public transportation stations within a five-minute walk time, a clear and organized street networks that link different places of activity, and a safe and attractive environment with an adjacent mix of uses and activities that provide an enjoyable walking environment (Patel *et al.* 2016). Encouraging strategies and using incentives such as lowering the price of public transportation, free bikes, car-sharing service, and public transit pass, or making public transport more attractive, affordable, regular, and extensive can have a positive impact on local residents (Doheim, Farag and Badawi 2020). Figure 28 shows the proposed scenario to improve the accessibility and walkability of both beach area and the Avenue de la cooperation.

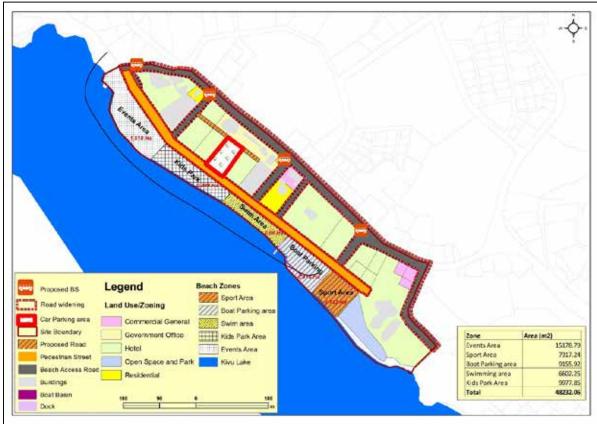


Figure 29: Proposed scenario to improve accessibility on "Avenue De la Cooperation"

From the above Figure 28 the new car parking area has been identified on public vacant land owned by Rubavu District. This undeveloped land parcel is adjacent to the land parcel of the Rubavu District Office.

8.6.1. Constructing a parking area

Off-street car parking areas should make a positive contribution to the surrounds and will serve a functional capacity of the beach. The safety, streetscape, landscape and pedestrian and cycle users will be considered in the design of the car park area. To achieve the safety, this parking area should provide clear and safe pedestrian paths between car parking areas and the use; minimize visual obstructions in parking areas for vehicles and pedestrians; provide passive surveillance of parking area by ensuring that they are not out of public view; and ensure that lighting is provided throughout parking areas and to pedestrian paths for night safety within the car park and to enhance passive surveillance from the street







and buildings on the site. The Figure below illustrates the conceptual design of the car parking area for all visitors to Rubavu Public Beach.





Figure 30: Conceptual design of the proposed car parking area

The streetscape of the parking areas should avoid large concentrated car parking area as it may degrade the site's amenity and reduce passive surveillance opportunities. Pedestrians should be provided with a clear and direct link, including a dedicated pedestrian path, which connects to building entries or the







street through any car parking area. It is also important to consider the option of sharing parking between uses to increase efficiency and to avoid an over-supply of parking spaces.

Landscaping of the parking area should have a well-integrated hard and soft landscape treatments provided consistently throughout the car park, landscaping at the inception of the car park design to ensure it is accommodated appropriately to perform its purpose; sufficient space allocated to landscaping to ensure it does not impede on pedestrian and vehicle requirements, safety or other entities. Bicycle parking should also be planned and appropriately designed to provide clearly visible bicycle parking facilities within accessible and convenient locations with adequate passive surveillance. Pedestrian paths that connect the beach users with both the car park and external footpaths network should be a primary focus of the car parking design. It should consider a connected pathway network, including pedestrian priority crossings across vehicle aisles; clear, prominent and direct pathways to key access points such as to building entries and from key locations external to the site; safe pathway design (crossing points, use of appropriate signage and line markings, vehicle overhang not to encroach onto pathway).

8.6.2. Road widening

While the area around Rubavu Public Beach is zoned for hotels, recreational and tourism activities, the city planning authorities of Rubavu District will request the land and housing developers to widen streets or to make other transportation improvements to account for the traffic impacts of the new buildings. The road to be widened are only the access roads to the beach and to the existing hotels adjacent to the beach area. As the width of the alternative road access to the existing buildings is not sufficient for the traffic, a road widening project should be commissioned to improve traffic safety and capacity. This project would reflect strategic widening, extensions and connections of roadways to offer drivers a safety benefit and to increase the capacity of existing streets. On the national road passing near the Rubavu District Office to Goma City (DRC), the road widening may take the form of adding a turning lane or widening a one lane road to a two lanes road boulevard. This project will help the property owners and hotel visitors to access these buildings via the national RN4, rather than using the "Avenue de La Cooperation" that will be developed as a car free street and a car free promenade area.

8.6.3. New access road to be created

As shown in Figure 20, connecting new roadways to existing ones may be another option to improve the access and accessibility of the underdeveloped land parcel which cannot be access either by the main Road RN4 or by the pedestrian street of the "Avenue de la Cooperation". This roadway connections may include new or reconstructed roads that link inaccessible land parcels. Overall, such a project would not add substantially to the total road mileage of the beach area but would strategically deal with areas of growth and long-standing blockages.

8.6.4. Bust stops and turnouts

The bus stops are the first point of contact between the passenger or visitors and the public transport service by bus. To improve the quality of bus services for all visitor to Rubavu Public beach area, a well-planned network of the bus stops is recognized as a crucial element. In transit service planning, it is generally assumed that most customers will not walk more than 400 meters to a transit stop. As a result, bus stops should be placed no more than 400 meters apart, as a general rule. In areas of high density development, transit stops may be necessary as frequently as every two blocks (200 meters apart). The following factors have been considered when selecting the type of bus stop: potential customers passengers; passenger origins and destinations; pedestrian access including accessibility for handicap and wheelchair customers; adjacent land use and activities; intersection geometrics; parking restrictions







and requirements; traffic control devices; physical roadside constraints (trees, poles, driveways, etc.); and intersecting transit routes.

Specifically for this feasibility study, four new bus stops have been proposed on the main road NR4 from Kigali to Goma and which passes near the Rubavu District Office (Figure 20). The proposed bus stops are well located by considering the intersection geometrics of the existing road access network to the beach area. All of these planned bus stops are within an acceptable walking distance of less than 500 meters. Design of the bus stop layout should enable safe and smooth flow of bus and passengers. Bus stops should provide required facilities for safe boarding and alighting of passengers. The location of these bus stops will significantly influence bus transit system performance and customer satisfaction. The choice of the location is primarily related to the operational performance of the bus route and traffic, but can also be influenced by the adjacent land uses and opportunities for easy transfer to crossing bus routes. Bus stop layout will enable safe and smooth flow of bus and passengers to board and alight without the bus significantly impeding or delaying the adjacent traffic.

8.6.5. Shelters on waiting area of bus stops

Comfortable and secure passenger waiting areas need to be provided at bus stops. These consist of spaces apart from normal sidewalk for passengers to congregate, sit, and be protected from the weather. A paved landing area located immediately adjacent to stopped bus for boarding and alighting passengers is also very important. Generally, bus stops should work efficiently and provide passenger comfort, safety, and personal security.

The New Master Plan for Rubavu envisages to enhance green transport and strategies, such as walking and cycling, while improving accessibility of public transport. This can be achieved by integrating public transport with Non-Motorized Infrastructure. The implementation of this strategy is very easy since walking, motorbikes and bicycles are the most commonly used means for local transport in Rubavu (RHA and GGGI 2019). To improve the public transport network, the New Rubavu City master plan recommends that Bus Stops should be located within 500 m walking distance to public transport. NMT

8.7. Management of the "Avenue de la Cooperation"

The management of pedestrian spaces is considered as one of the strategies in improving mobility as well as ensuring the sustainability of street space. Specific design principles must be adhered to in order to maximize the benefits of "Avenue de la Cooperation" as a car free street and for its optimal conceptual functioning. This area should be accessible by means of a limited number of entry points. If a great number of entrances is required, it would necessitate the security service in many places to prevent entry of non-admissible motorized traffic. For cyclists and pedestrians, the number of entrances and exits may be larger. When the Avenue de la Cooperation will be converted into a car free promenade area, only inevitable goods and services traffic will be allowed to use this street. The only vehicles that will have free access will be the emergency vehicles like ambulance or fire brigades. The layout of "Avenue de la Cooperation" car free promenade will adhere to required international standards and ensure there are clear and consistent street signs, adequate street furniture, clean pavements, toilet facilities and street lights.

8.8. Pedestrian Infrastructure on "Avenue de la Cooperation"

Pedestrian facilities are an essential part of the bigger transportation system in an urban area. Pedestrian facilities is a general term for various facilities used by pedestrians. Examples are sidewalks, walkways, trails, crosswalks, bridges, etc. They provide people with space to travel within the public right-of-way that is separated from roadway vehicles. There are many factors to be considered in order







to come up with a good design of pedestrian facilities. Good design essentially means a design that gives a satisfactory service to its users. Listed below are the different factors that shall be taken into consideration in designing or evaluating pedestrian facilities, particularly sidewalks, shoulders, trails, and walkways (Gacutan and Tan 2012). The Table provide a list of criteria and sub-factors to be considered when providing the pedestrian facilities along the avenue de la cooperation.

Table 14: Criteria and Sub-Factors for Providing Pedestrian Facilities

Criteria	Sub-Factors Sub-Factors		
Level of congestion	Enough space for working		
Safety	 Presence of guardrail. marking separation between street and sidewalk Height difference between street and sidewalk Lighting in the walking area Availability of pedestrian signal 		
Convenience	 Width of the facility Surface condition of the facility Presence of shops 		
Comfort	 Air Quality Presence of trees or shrubs		
Continuity	 Pedestrian-Car conflict Presence of street furniture Presence of vendors 		
System coherence	 Presence of information signs Architectural relation of sidewalk and nearby building 		

Source: (Gacutan and Tan 2012).

When designing a functional pedestrian street on *Avenue de la Cooperation*, the following basic principles proposed by Liptan (2017) should be taken into account:

- Connectivity: a street network of the "Avenue De La Cooperation" pedestrian street will connect major nodes in the Rubavu City between which pedestrians have to move. People's basic needs in this pedestrian street such as the need for fresh air, water, recreational opportunities, as well as public toilets should be available. The access to public transport is important and should move within the city's green infrastructure network if possible. Since the "Avenue De La Cooperation" pedestrian street will be adjacent to recreational, commercial activities and hotels, fire safety measures must also be taken as mandatory design considerations.
- Comfort: The pedestrian street area must be of appropriate width. Appropriate materials should be used to ensure comfortable movement. Steep slopes and slipping risk should be avoided. Sidewalks and pedestrian paths should be positioned to allow a safely movement. Street amenities must be designed in accordance with the climatic conditions of the area.
- Lighting conditions: This pedestrian street and its sidewalks must be always illuminated during the dark hours. Street lights with adequate illumination along walkways will ensure security to pedestrians.
- Visual View: The Image of a pedestrian street should be visually attractive, in accordance with the
 city's identity with respect to cultural and historical heritage. The footpath should be suitable for
 communication among people without unnecessary noise and air pollution
- Clarity: Pedestrian routes should be easy to understand with clear signs, images, pavement markings, landmarks and sign posts. Prior to pedestrianizing the Avenue de la Cooperation, it is important to make the right strategic decisions regarding the use of open spaces. The location of landmarks, the strategic planning of squares and "pockets" will encourage the use of infrastructure. The design of open spaces and greenery are crucial factors in maintaining an appropriate climate in







that area. Potential climatic conditions in this area should be taken into account when planning the business activities to be carried out on this car free beach promenade.

• Green infrastructure: an open and green space should be planned in relation to the surrounding buildings. It is imperative to strengthen the green network to improve the local climate, biodiversity, water absorption, general comfort and recreational opportunities Mendzina and Vugule (2020).

8.9. Business Activities on "Avenue de la Cooperation"

It is proposed that the Avenue de la Cooperation is converted into a car free zone which will be used for various activities and business. As an alternative source of income the following activities are proposed:

8.9.1. Visitor Centre

The Visitor Center should be located near the "Avenue de la cooperation" at the entrance point to the beach from the area designated to car parking area. This will be the first point of contact where beach users will be registered and code of conduct handed over to them. Any payments to be made or booking for services will be done at the visitor center. The tourist will be provided with information on the beach usage, safety requirements, protection of the environment and other relevant information The small business that take place on the beach should all be registered at the visitor center. These include the boat owners, photographers, curio sellers and all others. It is proposed that Rubavu District manages the registration the business people while the private manager coordinates the different activities demanded by beach users like boat rides. Below is a pictorial view of the Visitor Center that was proposed in the Rubavu Beach Management Plan (Jeong 2018).



Below is a visual view of our proposed visitor center entrance and layout.









Figure 31: Main Entrance of Visitor Centre to Rubavu Beach



Figure 32: View of the Visitor Centre







8.9.2. Bicycles

It is proposed that one of the activities to be promoted on the Avenue de la Cooperation is bicycles hiring and riding. These will hired at a reasonable fee. Different types of bicycles will be available including mountain bikes for use on the biking trails or for leisure riding. The design of the cycling infrastructure will be well suited to ensure adequate safety and an organized flow of traffic is observed. The cycling infrastructure to be provided on the Avenue de la Cooperation will include bike paths, bike lanes and adequate bike racks for parking. A dedicated cycling infrastructure needs to be optimized for cycling to tap the full potential (Brezina et al. 2012). Cycling and walking are proposed as the most convenient way to move around the "Avenue de la Cooperation" and an important advantage is that they have the least impact on the environment. Switching from driving to cycling reduces the carbon emissions and improves air quality because of the flowing reasons:

- Bicycle use reduces CO² footprint: compared to cars and buses, the product life cycle of a bicycle generates minimal carbon emissions.
- **Cycling will improves the local air quality:** local air quality improves drastically when switching from cars to bicycles.
- Cycling will helps to improve the quality of the public space: public space will be improved by turning car parks into bike lanes and playgrounds with green areas to improve the local environment. Since cycling is silent (non-motorized transport mode) and helps to reduce traffic noise.



Figure 33 Bicycle Parking Rack
Source: https://nohat.cc/f/black-and-red-bikes-parked-under-trees/317c945934ac4bae8315-201907071005.html

Cycling as a means of transport is on the increase in towns and cities, and further growth in the number of cyclists is expected in the coming years. A bicycle parking rack should be provided for bicycles for parking purposes. Bike racks can be constructed from a number of different materials. Durability, weather resistance, appearance, and functionality are extremely important factors when choosing the material of the bike rack. Construction materials may include stainless steel, steel, recycled plastic, or thermoplastic. Each material has advantages and disadvantages, and each is unique in appearance from the others. The visibility of the bike rack, adequate spacing from automobile parking and







pedestrian traffic, weather coverage, and proximity to destinations are important factors determining usefulness of a bicycle rack. These factors will increase usage of the bike rack, and assure cyclists their bike is securely parked.

The following guidelines will assist in the design and development of high-quality bicycle parking facilities within future properties along the "Avenue de la Cooperation". The goal will be to meet the quantity and type needed to support all cyclists and to encourage this active transportation mode. There are two categories of off-street bicycle parking: A short-term parking period for a bicycle parking space for visitors or patrons of the building. For bicycles parked for a short period (i.e., less than 4 hours) in locations that are easily accessible. Long-term parking period for a bicycle parking space for employees or residents of the building. For bicycles parked for longer periods (i.e., more than 4 hours), typically requiring more secure parking (Celis and Bolling-Ladegaard 2008).

Regarding the location and access, increased uptake in cycling as a viable travel mode may not reach its full potential if bicycle parking security is not considered at the planning and design stages. Bicycle parking should consider all types of bicycles and be designed to meet the needs of all ages and abilities. To that end, there are several guiding principles (City of Toronto 2008) that influence how both bicycle parking is located and accessed:

- **Well-located:** Convenient, accessible, as close as possible to the destination, and weather protected.
- **Stair-free:** Access provision of ramps or elevators large enough to accommodate all types of bicycles. Slopes should be limited.
- Minimum Widths: Appropriate widths shall be provided along all routes required to access bicycle
 parking facilities, including along ramp accesses, at doorways, and aisle widths in bicycle parking
 rooms.
- **Signage:** Integrated, high-quality, and simple bicycle parking signage should be provided to indicate the availability and location of an off-street bicycle parking area.
- **Visibility:** The location selected for bicycle parking shall be easily identifiable by cyclists as they are riding. It will also help to reduce theft and vandalism.
- Barrier-free: Access to bicycle parking facilities should be direct and free from obstacle to accommodate all users. Provide breaks in long lengths or span of bicycle racks to allow users a more convenient path for access and egress.
- **Detestability:** Design should be cognisant of users with physical, sensory, or cognitive impairments and should ensure the facilities are both easily detectable for these users and do not create obstacles.
- **Lighting:** Quality lighting shall be provided to ensure facilities are well-lit to improve the overall security of all bicycle parking facilities. Tamper-proof features should be considered to prevent vandalism
- Security: Racks in visible, well-lit places that have high levels of natural surveillance.

8.9.3. Gift, Coffee Shops and small businesses

These will be at least 3 and they will be hired out to business people to sell gifts and different curios that depict the local Rwandan culture. The gift shops or souvenir shops are the stores primarily selling souvenirs, memorabilia, and other items relating to a particular topic or theme.









Figure 34: Model of business shops to be located on Avenue de la Cooperation

The items sold will include coffee mugs, stuffed animals, toys, t-shirts, postcards, handmade collections and other souvenirs, intended to be kept by the buyer as a memento of their visit, or given to another as a gift. The hotels e located along the *Avenue de la Cooperation* will be given the priority to feature the gift shop near their entrance. A number of shops will be hired out offering different products that are popular on a beach. Proposed are ice cream parlors, cafes, fast food take away stands (hotdogs, chips, soda, and juices).







The available land area which can be used for small shops on one side of the *Avenue de la Cooperation* was estimated to 2500 m². This land area can accommodate more than 100 small shops for different business like ice cream parlors, cafes, fast food take away stands (hotdogs, chips, soda, and juices). The owners of these shops will be allowed to put a cart on the beach offering the same products.

8.9.4. Child Care Services

Space will be hired out for a professional company to offer child care services at a fee. Normally families come to beaches and this services would be helpful for the adults that would like to relax. Registration of the child care services will be done at the office on the car free zone then a child minder has to be provided to care for the kids and provide them with adequate entertainment and care.







8.10. Legal Implications of Car Free Street

The conversion of the "Avenue de la Cooperation" to pedestrian Car Free Zone or promenade area will be subject to the guidelines on the land conversion in line with the National Land Use Planning Guidelines that were published by the Ministry of Environment (Government of Rwanda 2017). This conversion of land will involve the process through which the ownership of land may change from either public to private or vice versa. Any development that takes place within the buffer overlays and in immediate surrounding shall respect the environment and the landscapes of the surrounding areas. The Rubavu District in coordination with REMA may facilitate the Transfer of Development Rights (TDR) or offer incentive packages to motivate the property owners towards sustainable development and conservation. There is a need for the tourism facility within the area and is not conflicting with the public interest. The location and development of the tourism facility should be consistent with the health, safety and wellbeing of people residing or working in the nearby. There should be adequate infrastructure services such as utilities, access, parking required to support the proposed tourism facility. According to the revised master of Rubavu City, the tourism overlay zone allows the flexibility for city to promote tourism in certain areas as well as encourage or discourage certain types of development that may impact on the lakefront image. In that regards, The Sports and Eco-Tourism Zone was established to provide parks that offer active recreational uses with sporting facilities and forests with eco-tourism activities. The cultural facilities such as museums, art centers and concert halls are also allowed in this zone. While structures within the tourism zone are allowed, the general character of the sports and ecotourism zone should remain as green and recreational. All buildings in these zones shall adhere to the "Green Building Minimum Compliance Guidelines Government of Rwanda (2019).







9. FIVE YEARS FINANCIAL PROJECTIONS

Financial projections have been developed for Rubavu Public Beach and Avenue de la Cooperation in Rwandan Franks and United States Dollars and cover a period of five (5) years. The financials are based on the following assumptions

- There will be no global, or regional unrest that will negatively impact the current positive image of Rwanda as an ideal investment and holiday destination.
- There will be no global crisis or phenomenon that adversely affects the tourist source market numbers
- The service and facilities offered at the Rubavu Public Beach will be of international standards and attractive to a wide target market
- The support infrastructure required for the successful implementation of the project will be supplied in an efficient and regular manner. This includes the electricity, water, sewage treatment, roads and others
- The roads network and transportation system from Kigali and other parts of Rwanda to Rubavu will be well developed and efficient to improve accessibility to Rubavu
- The management company for Rubavu Public Beach and Avenue de la Cooperation will engage in aggressive sales and advertising campaigns to ensure a steady flow of visitors

9.1. Investment Cost

It is proposed that the construction of different projects on the beach will be taken up by an investor who will provide private capital to develop the investments. The Rubavu District will make the project attractive to investors by ensuring an enabling environment and providing the investor with a lease for an appropriate number of years to recoup the capital invested. The investor will pay rent to the district for the period of the lease. Details of the lease and the application process will be provided in the Terms of Reference document and the Management contract to be signed between the Investor and the Rubavu District. Apart from developing the projects, the investor will provide several benefits to the Rubavu District including (i) Participating in Community Social Responsibility activities like landscaping and beautification around their premises, regular cleanup drives of the Rubavu Public Beach and the Avenue dela Cooperation, (iii) Providing employment opportunities for the local community (iii) Paying taxes to the Government. Details of the investment costs are as below

Section	Number	Unit Cost Rwf	Total Cost Rwf	Total Cost USD
Sports Area	1	252,700,845	252,700,845	247,568
Boat Parking Area	1	471,221,258	471,221,258	461,651
Swimming Area	1	199,634,871	199,634,871	195,580
Kids Park	1	94,739,516	94,739,516	92,815
Events Area	1	603,753,937	603,753,937	591,492
Main Public Parking	1	263,062,240	263,062,240	257,719
Visitor Center	1	19,183,739	19,183,739	18,794
Shop	5	14,098,142	70,490,710	69,059
Total Construction Cost	-	•	1,974,787,116	1,934,679







Total Investment Costs

Item	Rwf	USD
Total Construction Cost	1,974,787,116	1,934,679
Pre Opening Costs 10% Total construction cost	197478711.6	193,468
Working Capital 10% of total Construction	197478711.6	193,468
Total Investment Cost	2,369,744,539	2,321,615

9.2. Sources of Income to private Investor and Rubavu District

Entrance to the Rubavu Public Beach will be free of charge for all visitors, however the private investor will charge visitors for the services provided. Each zone will be offering a different activity, service and attraction. Below are suggested pricing the private investor will charge based on prices charged for similar products in Rwanda, regionally and internationally. As mentioned, the private investor will pay the Rubavu district rental fees at an amount to be agreed upon in the management contract.

		PRICE PER UNIT RWF	QUANTITY
7.	EVENT ZONE (hired out)	1,500,000	1Day
8.	SPORTS ZONE (hired Out)	1,500,000	1 Day
9.	KIDS PARK	10,000	Per Child per day
10.	SWIMMING ZONE	10,000	Per Person
11.	SHOPS (Hired out)	700,000	Per month
12.	CAR PARK – VISITOR CENTER Hired Out	700,000	Per Month

The events zone will cater for different events including concerts, weddings and others. Sports zone will be hired out for volleyball, soccer or other sports activities on the zone. The kid's park will be equipped with different games and activities and all kids accessing this area would be required to pay an entrance fee. The swimming zone will be well equipped with chairs and umbrellas and these will be hired out. There will be a total of 5 shops to start with and in the future these can be increased because there is adequate space. The shops will be hired out to private investors to offer various services and commodities to be consumed by the visitors and locals. There will be a small visitor center within the car park area. This will be hired out together with the car park to a private investor to use as a car ticketing office. The visitor center will also be used as a registration desk for the temporary service providers like beach boys, photographers etc

9.3. Assumption Data on Sales for Each Source

ZONE	SALES FREQUENT	SALES/WEEK	SALES/MONTH	SALES/YEAR
	FORMULA	WEEKX4		MONTHX12
EVENT AREA	16 Times in a month	3,000,000	12,000,000	144,000,000
SPORT AREA	16 Times a month	2,000,000	8,000,000	96,000,000
KIDS PARK	400 kids per week	4,000,000	16,000,000	192,000,000
SWIMMING AREA	400 swimmers per week	4,000,000	16,000,000	192,000,000
SHOPS	Each hired Rwf 700,000 per month	1,750,000	7,000,000	84,000,000
PARKING CENTER	1 center for rent	175,000	700,000	8,400,000
	TOTAL	14,925,000	59,700,000	716,400,000







9.4. Annual Revenue Projections

ZONE	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
EVENT AREA	288,000,000	314,760,000	328,200,000	332,640,000	330,960,000	1,594,560,000
SPORT AREA	96,000,000	104,000,000	109,400,000	110,880,000	110,320,000	530,600,000
KIDS PARK	192,000,000	200,000,000	218,800,000	221,760,000	220,640,000	1,053,200,000
SWIMMING						
AREA	192,000,000	200,000,000	218,800,000	221,760,000	220,640,000	1,053,200,000
SHOPS	84,000,000	8,400,000	8,400,000	8,400,000	8,400,000	117,600,000
VISIT CENTER	8,400,000	84,000,000	42,000,000	42,000,000	42,000,000	218,400,000
TOTAL	860,400,000	911,160,000	925,600,000	937,440,000	932,960,000	4,567,560,000

9.5. Expenses

- 1. Most of the expenses are onetime expenses
- 2. Sales & Marketing including advertisement basing on radios and TVs stations price per month 5 min 3 times a day
- 3. Salaries and wage considered only top managers basing on standard salaries they used to earn in Rwanda (MD,OP,S&M,DAF&HR
- 4. Repair and Maintenance will not exceed 1,000,000 per month
- 5. Electricity expenses Rwf 96/ kWh 3600 per month
- 6. Insurance expenses based on rates of property insurance in Rwanda is 500USD
- 7. Non-Operating Expenses will not exceed 2,500,000 Rwf

Item	Unit Cost	Annual Cost
Sales and Marketing	1,00,000	12,000,000
Salaries and Wages	5,000,000	60,000,000
Utility	445,600	5,347,200
Repair and Maintenance	1,000,000	12,000,000
Other	2,500,000	30,000,000
Total	9,945,600	119,347,200
Non-Operating Expenses		
Insurance	500,000	6,000,000
Other	1,000,000	12,000,000
Total	1,500,000	18,000,000
	Total Annual Expenses	137,347,200







EXPENSES	YEAR1	YEAR2	YEAR3	YEAR4	YEAR5	
Sales and						
Marketing	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Salaries and Wages	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	
Utility	445,600	445,600	445,600	445,600	445,600	
Repair and						
Maintenance	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Others	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	
Insurance	500,000	500,000	500,000	500,000	500,000	
Other	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
TOTAL	10,445,600	10,445,600	10,445,600	10,445,600	10,445,600	

9.6. Rubavu Public Beach 5 Years Profit And Loss Projections

Sales Year 1 Year 2 Year 3 Year 4 Year 5 TOTAL						
Sales	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Events area	288,000,000	314,760,000	328,200,000	332,640,000	330,960,000	1,594,560,000
Volleyball playground	96,000,000	104,000,000	109,400,000	110,880,000	110,320,000	530,600,000
Children's park	192,000,000	200,000,000	218,800,000	221,760,000	220,640,000	1,053,200,000
swimming area	192,000,000	217,840,000	218,800,000	221,760,000	220,640,000	1,071,040,000
Visitors center	8,400,000	8,400,000	8,400,000	8,400,000	8,400,000	42,000,000
shops	84,000,000	84,000,000	42,000,000	42,000,000	42,000,000	294,000,000
·	, ,	, ,	, ,	, ,		, ,
Gross sales	860,400,000	929,000,000	925,600,000	937,440,000	932,960,000	4,585,400,000
Operating Expenses						
Sales and marketing	12,000,000	12,593,000	12,623,000	12,725,000	12,653,000	62,594,000
Salaries and wages	48,000,000	50,372,000	50,492,000	50,900,000	50,612,000	250,376,000
Utility costs	5,347,200	5,611,441	5,624,809	5,670,260	5,638,177	27,891,886
Property operations & Maintenance	12,000,000	12,593,000	12,623,000	12,725,000	12,653,000	62,594,000
Other Operating Expenses	30,000,000	31,482,500	31,557,500	31,812,500	31,632,500	156,485,000
Total Operating Expenses	107,347,200	112,651,941	112,920,309	113,832,760	113,188,677	559,940,886
Non-Operating Expenses	,	,	,	,	,	
Insurance	6,000,000	6,000,000	6,000,000	6,000,000	6,000,000	30,000,000
Other Non-Operating expenses	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	60,000,000







Total Non-Operating						
expenses	18,000,000	18,000,000	18,000,000	18,000,000	18,000,000	90,000,000
Total expenses	125,347,200	130,651,941	130,920,309	131,832,760	131,188,677	649,940,886
Profit before tax	735,052,800	798,348,059	794,679,691	805,607,240	801,771,323	3,935,459,114
Tax 30%	220,515,840	239,504,418	238,403,907	241,682,172	240,531,397	1,180,637,733
Profit after tax	514,536,960	558,843,642	556,275,784	563,925,068	561,239,926	2,754,821,380

9.7. Cost Benefit Analysis in 5 Years

5171 COSC Deficite	Allarysis iii 5 Tears			
Cost Benefit Analysis	In 5 Years			
				cost benefit
Zones	Investment cost	Sales	Cost Benefit	percentages
Events area	603,753,937	1,594,560,000	990,806,063	38%
Volleyball				
playground	252,700,845	530,600,000	277,899,155	48%
Children's park	94,739,516	1,053,200,000	958,460,484	9%
swimming area	199,634,871	1,071,040,000	871,405,129	19%
Visitors				
center/Parking	19,183,739	42,000,000	22,816,261	46%
shops	70,490,710	294,000,000	223,509,290	24%
			_	

- 1. Event Area will generate 38% of its investment cost equivalent to RwF 990,806,063 of profit in 5 years
- 2. Sport area(Volleyball playground) will generate 48% of its investment cost which is equivalent to the profit of Rwf 277,899,115 in 5years
- 3. Children's park will generate 9% of its investment cost which is equivalent to the profit of Rwf 958,460,484 in 5 years
- 4. Swimming area will generate 19% of its investment cost which is equivalent to the profit of Rwf 871,405,129 in 5 years
- 5. Visitor center will generate 46% of its investment costs which is equivalent to the profit of Rwf 22,816,261 in 5 years
- 6. Shops will generate 24% of its investment costs which is equivalent to the profit of Rwf 223,509,290 in 5 years

9.8. Return on Investment

RETURN ON INVESTMENT	
Total Investment costs	2,369,744,539
	ı
Net profit (in 5 years)	2,754,821,380
%Return on Investment	16%







16% return on investment shows that the project is viable	
Project will generate (give back) the rate of 16% as return to the investment made	
which is good	
PAYBACK PERIOD	
*Project will cover its investment in 4 years, 7months and 20 days	
Narrative	
The table above shows the Financial projections Summary of RUBAVU PUBLIC BEACH	
in 5 years period.	
* Gross sales totals to	4,585,400,000
* The Expenses totals to	649,940,886
* Taxes totals to	927,066,896
* The Net Profit is	2,754,821,380
*The Total Investment costs	2,369,744,539
ROI (Return on Investment)	16%







CONCLUSION

The Kivu Belt has recently been experiencing a rapid rise in tourism arrivals especially because the improved road infrastructure has made Rubavu more accessible. One of the most visited destinations in Kivu Belt is the Rubavu district which is home to the Rubavu Public Beach, a popular destination and the palm-lined Avenue de la Cooperation next to Rubavu Public Beach which is also a very popular recreational area for locals and visitors to Rubavu. The objective of this assignment is to develop a feasibility study that guides on the process of transforming Rubavu Public Beach into a privately managed public beach offering international standards of service, facilities and products. The study also aims to guide on the process of converting Avenue de la Cooperation into a car free beach promenade. Having developed a detailed study on the Rubavu Public Beach and the Avenue De La Cooperation, we are of the conclusion that:

- Rubavu Public Beach requires a major overhaul to transform it into an internationally recognized destination.
- Avenue de la Cooperation is currently a popular destination where visitors visit for various recreational activities like jogging, bicycle riding and relaxing. To increase its potential there is a need to convert it into a car free zone and revamp the services offered here to include shops and fun activities.
- Rubavu District are currently managing the Rubavu Public beach however the District does not have the funds to undertake the development of both projects.
- There is therefore the need to source for a private investor who is interested to investing private funds into the project under a management lease with the district.
- The financial projections developed over a five year period indicate that the project is viable with a 16% Return on Investment.







Annexes of detailed costs estimation

Annex1: Estimated Cost for Sport Area

	BILLS OF QUANTITIES FOR EXTERNAL WORKS	AL WORKS			
ltem	Designation	Unit	QTY	Unit price(Rwf)	Total Price(Rwf)
Α	ELEMENT NO 1: PRELIMINARIES AND LEVELLING WORKS				
1	PRELIMINARIES AND LEVELLING WORKS				
101	Site installation including site hoarding, site offices with all furniture, Avail drinking water on the site, site sanitation and	ITEM	1.00	4,500,000	4,500,000
	cleaning during execution, Site signage, latrines and site documents such as drawings, copy of site insurance, site Log				
	(journal de chantier), attachments book, Order books (Site				
	communications), Attendance register and Stock records, safety workers, site shelters during the execution period.				
102	Site Clearing and removal of unwanted trees, grasses, Vegetable	WS	444	2,500	300 000
103	DUMP SITE (dump site to be determined and paid by Contractor under supervision of Environment protection District unit): After	ITEM	1.00	1,800,000	1,800,000
	landfilling in dump site, Contractor must develop the dump site				
	(compaction and greening the site or any other method to avoid sand sliding into the lake) for environment protection				
104	Antitermite (Termidal), treatment to sides, bottoms of excavation, and soft of hardcore, all site treatment to remove all insects in soil	SM	1,944.00	1,500	2,916,000
	TOTAL FOR PRELIMINARIES AND LEVELLING WORKS				0 576 000
В	ELEMENT NO 2: CONSTRUCTION OF CHANGING ROOM				,
	BILLS OF QUANTITIES FOR LAUNDRY & CHANGING ROOM				
I	FOUNDATION				







303	302	301			202	201	=		103	102	101
Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for ring beam and its Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for foundations (footings), sub-columns, and columns and its Formwork .Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for ground beam and its Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	CONCRETE WORKS	S/Total	Walling with burnt bricks, 20 cm thick, built in cement and sand mortar with 300Kg/m3, with straight horizontal and vertical joints and regular form.	Damp proof Course (Roofing)	WALLING	S/Total	Foundation in stones joined by mortar cement proportioned with 300Kg/m3.The faces remaining visible will have to be assembled carefully in apparent masonry including the well compacted back fill.	Plain concrete (Bottom and top of foundation) 50mm thick using ratio of 250kg /m3	Excavation of Foundation trenches and footings and remove the Excavated soil to the dump site
CM	CM	CM			CM	ਸ਼			CM	CM	CM
2.64	3.41	2.64			8.43	13.60			23.52	2.99	36.48
300,000	300,000	300,000			60,000	1,000			55,000	110,000	3,000
792,000	1,022,400	792,000		519,520	505,920	13,600		1,731,940	1,293,600	328,900	109,440







	S/Total				2,606,400
<	ROOF STRUCTURE AND COVER				
401	Supply, screws, and assemble structural Steel trusses as indicated in structural drawings, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client): 60x40x1.5mm	Ī	160.00	5,000	000,008
402	Supply, screws, and assemble structural Steel trusses as indicated in structural drawings, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client): 40x40x1.5 rectangular	lm	81.00	4,000	324,000
403	Supply BA iron sheets BG28 roof cover in black color and fix them to trusses	SM	97.20	10,000	972,000
404	Supply and fix roof ridge iron sheets BG 28, color to be approved by client	lm	16.20	7,000	113,400
405	Supply and fix facial board, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client)	lm	10.00	10,000	100,000
406	Supply and fix gutters 200*150*150mm, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client)	ਜ਼	24.40	8,000	195,200
407	Rainwater installations 'U.P.V.C. Pipes, gutters and fittings, Pipes with solvent welded joints fixed to walls with holder bats (140), including Extra for outlet in pipe, Extra for shoe in pipe, Galvanized steel wire balloon grating wrapped in mosquito gauze and set in pipe diameter - 110 mm (PN6)	Z	24.00	4,000	96,000
	S/Total				2,600,600
<	DOORS AND WINDOWS				
501	Supply and install a Alluminium windows of 1200 mm height and 1200mm wide with 6mm thick clear glazed panel. Referring the Details to the Windows & Doors Schedule drawing	NO	10.00	96,000	960,000







607	606	605	604	603	602	601	≤			502
Outside drainage works in stone hardcore and concrete (non-reinforced) of 50mm thick lean concrete mix, 50cm apron around the building and U shape drain of 35cm includes the cover of U shape drain made in angle iron 40x40 and steel bars of 16mm	200mm thick well compacted hardcore filling with quarry dust layer to receive surface bed	Prepare and apply three coats of first grade of weather guard paint on external lintel, beam, columns and plastered external area	Prepare and apply three coats of first grade of Silky Vinyl paint on internal lintel, beam, columns and plastered internal area	Prepare and apply three coats of first grade Emulsion paint on Internal and external skirting	Internal and external skirting in cement mortar of 100mm high	Apply plaster, first coat cement and sand (1:3); second coat of cement,(1:2) steel travelled includes internal wall, external wall and columns and beams	WALL, FLOOR AND CEILLING FINISHING	S/Total	Supply and fix Timber Flash Door Specified and approved by Client	Supply and fix to concrete or blockwork: purpose made powder coated Alluminium doors and frames: plugged and screwed: including all necessary accessories: pointing in mastic all round: with and including 6mm thick toughened tinted or reflective glass:101 x 62 x 2 mm frames, mullions and transoms: The doors to be complete with hinges, Lock Case & Cylinder (174 x 67mm) 85mm centres - 40mm & 60mm backset, with 3 lever Mortice lock and handles on rose & escutcheons-Solid stainless still -satin Toucan, Aluminum doors size 900 x 2200mm high in one equal leaves.
M	CM	SM	SM	M	LM	SM			O	NO
42.40	16.20	28.38	110.22	34.40	34.40	138.60			8.00	2.00
20,000	20,000	3,000	3,000	3,000	5,000	5,000			85,000	250,000
848,000	324,000	85,140	330,660	103,200	172,000	693,000		2,140,000	680,000	500,000







	diameter with 20mm spacing				
608	Ground slab of 100mm thick embedded with A142 fabric mesh concrete Floor Finishes with Cement, sand and Aggregates (1:1:2) screeds, of 100mm thick	CM	8.10	210,000	1,701,000
609	Floor Finishes with Cement and sand (1:3) screeds, of 50mm thick	MS	36.84	15,000	552,600
610	Supply and construct the ceiling finishes with PVC Ceiling includes sown cypress brandering at 600mm centres both directions and all necessary accessories	MS	11.40	12,500	142,500
	S/Total				4,952,100
SI	SANITARY APPREANCES FITTING AND FIXTURES				
	The Contractor shall, install, to the manufacturer's recommendations, complete with clamps and all necessary fittings, the following fittings				
701	supply and fixe Shower Units complete with mixer as specified with all accessories	NO	6.00	240,000	1,440,000
702	Supply and Fixe WC suite complete with cistern as specified	NO	2.00	350,000	700,000
703	Supply and Fixe Urinals with accessories	NO	1.00	120,000	120,000
704	Supply and Fix Wash Hand Basins with accessories for walkability	NO	4.00	140,000	560,000
705	Supply and fix Frameless mirror (Type 1) 450 x 600mm	NO	4.00	75,000	300,000
706	Supply and Fix Soap Dispenser	NO	4.00	25,000	100,000
708	Supply and Fixes Water heater(40liters) with accessories	NO	2.00	650,000	1,300,000







16.00 480,000 7,680,000 1.00 3,800,000 3,800,000 2.00 125,000 250,000 2.00 145,000 290,000 4,340,000 2,800,000 2,800,000 33,890,560 CM QTY unit price Total Price	FOUNDATION 101 Excavation of Foundation trenches and footings and remove the	Item Designation Un	BILLS OF QUANTITIES FOR TOILET	C ELEMENT NO 3: CONSTRUCTION OF TOILET FACILITIES	GRAND TOTAL	S/Total	901 Supply and install all necessary fixtures of building electricity Item	IX Electrical Installation	S/Total	802.2 9kg dry powder portable fire extinguishers as NAFFCO ABC Model NO NP6 or equal approved to hose reel cabinets and selected areas	5Kg Carbon dioxide fire extinguisher as NAFFCO CO2 gas 802.1 extinguisher model NC5 or equal approved to hose reel cabinets NO and selected areas	The Contractor shall supply, install and connect up the drainage 801 pipes to the satisfaction of the Engineer; Grease Trap as detailed ITEM out on drawing	VIII DRAINAGE SYSTEM - PIPES AND FITTINGS AND PORTABLE EXTINGUISHERS	S/Total	709 Supply and fix aluminum metal wardrobes with 60 mm wide and 2.2 m Height with accessories
ITEM 1.00 480,000 7,68 12,2	ches and footings and rer		BILLS OF QUANT	ON OF TOILET FACILITIES			/ fixtures of building elect			e reel cabinets as NAFFCO <i>i</i>	uisher as NAFFCO CO2 ga ual approved to hose reel	stall and connect up the or Engineer; Grease Trap as	ND FITTINGS AND PORTA		l wardrobes with 60 mm
16.00 480,000 7,68 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 12,2 13,8 13,8 14,34 17 17 18 19 19 19 19 19 19 19 19 19	:		ITIES FOR TOIL										λBLE		
480,000 7,68 12,2 3,800,000 3,80 125,000 250, 145,000 290, 2,800,000 2,80 2,80 33,8	CM	Unit	ET				tem			O	ON	TEM			NO
7,68 12,2 3,80 250, 290, 2,80 2,80 33,8		QTY					1			2.00	2.00	1.00			16.00
7,680,000 12,200,000 3,800,000 250,000 2,800,000 2,800,000 33,890,560 Total Price		unit price					2,800,000			145,000	125,000	000,008′ε			480,000
		Total Price			33,890,560	2,800,000	2,800,000		4,340,000	290,000	250,000	3,800,000		12,200,000	7,680,000





ratio of 250kg/m3

102



STYLOS



5.38

110,000

592,020

_					•	•
103		Foundation in stones joined by mortar cement proportioned with	CM)	1)
		300kg/m3.The faces remaining visible will have to be assembled carefully in apparent masonry including the well compacted back fill.		35.14	55,000	1,932,480
104	-	Excavation of Drainable Pit Latrine	CM	110.88	3,000	332,640
105		Stones Walling joined by mortar cement proportioned with 350Kg/m3. in drainable pit	CM	36.12	55,000	1,986,600
		S/Total				5,037,492
=		WALLING				
201		Damp proof Course (Roofing)	lm	89.70	1,000	89,700
202		Walling with burnt bricks, 20 cm and 10 cm thick, built in cement and sand mortar with 300Kg/m3. with straight horizontal and vertical joints, regular form, Pointed with mortar at external and internal side of walls due to drawings	CM	83.08	60,000	1,849,680
		S/Total				1,939,380
=		CONCRETE WORKS				
301		Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for bottom of drainable pit and Drainable pit	CM	9.50	300,000	2,851,200
		reinforcement, cutting, bending, hooking, tying and supporting as required.				
302		Vibrated reinforced concrete class 25/30 with 20mm maximum	CM	4 37	300 000	1 311 000
		fixing steel reinforcem oporting as required.				
		ייסטייים, יייים מוים משקרטי יייום מזי בממוי כמי				







CONSULTS

6,333,900				S/Total	
				fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	
760,500	300,000	2.54		diameter aggregate for lintel and Formwork Dismantling, supply,	
			CM	Vibrated reinforced concrete class 25/30 with 20mm maximum	304
				cutting, bending, nooking, tying and supporting as required.	
				Formwork in wood. Dismantling, supply, fixing steel reinforcement,	
1,411,200	300,000	4.70		diameter aggregate for foundations, sub-columns, and columns	
			CM	Vibrated reinforced concrete class 25/30 with 20mm maximum	303

N	ROOF STRUCTURE AND COVER				
401	Supply, screws, and assemble structural Steel trusses as indicated	lm			
	in structural drawings, Prepare and apply anti rust Two coats and		136.00	4,000	544,000
	three coats of first grade plastic emulsion paint (color to be				
	approved by client): 60x40x1.5mm				
402	Supply, screws, and assemble structural Steel trusses as indicated	≡			
	in structural drawings, Prepare and apply anti rust Two coats and		75.60	3,000	226,800
	three coats of first grade plastic emulsion paint (color to be				
	approved by client): 40x40x1.5 rectangular				
403	Supply BA iron sheets BG28 roof cover color to be approved by	MS			
	District and fix them to trusses		110.16	9,000	991,440
404	Supply and fix roof ridge iron sheets BG 28, color to be approved	m			
	by client		10.80	7,000	75,600
405	Supply and fix gutters 200*150*150mm, Prepare and apply anti	≡			
	rust Two coats and three coats of first grade plastic emulsion paint		21.60	10,000	216,000
	(color to be approved by client)				
406	Supply and fix facial board, Prepare and apply anti rust Two coats	≡			
	and three coats of first grade plastic emulsion paint (color to be		17.00	4,000	68,000
	approved by client)				







7		-	_	_	
ť	with solvent welded joints fixed to walls with holder bats (140), including Extra for outlet in pipe, Extra for shoe in pipe, Galvanized steel wire balloon grating wrapped in mosquito gauze and set in pipe diameter - 110 mm (PN6)	רוא	28.00	4,000	112,000
	S/Total				2,233,840
<	DOORS AND WINDOWS				
501	Supply and fixing Alluminium Window with frame columns of	pcs	10		
	75x75x2mm , apply anti rust Two coats and three coats of first			96,000	960,000
	grade plastic emulsion paint (color to be approved by client) for				
502	Supply and installation of Alluminium doors of 1000*2100mm. The	ltem	2.00		
	price includes glassing with 4mm glass thickness and grilling with			250,000	500,000
2	ZOXZONINI Netal tupes	F			
	frame. The price includes locking system			85,000	680,000
	S/Total				
					2,140,000
≤	WALL, FLOOR AND CEILLING FINISHING				
601	Apply plaster, first coat cement and sand (1:3); second coat of	MS			
	cement,(1:2) steel travelled to columns and beams		242.79	5,000	1,213,950
603	Internal and external skirting in ordinary Floor tiles 40x40cm of	Z	9		
604	Prenare and apply three coats of first grade silky vinyl on Internal	MS	, 6.00	10,000	,00,000
	and external and plastered area		152.49	3,000	457,470
605	Supply and Construct the ordinary wall tiles for bathrooms only	MS	141.48	12,000	1 607 760
	200x300mm ceramic wall tiles			12,000	1,69/,/60
606	200mm thick well compacted hardcore filling with quarry dust layer to receive surface bed	CM	18.36	20,000	367,200
607	Rough Floor Finishes with Cement and sand (1:3) screeds, of 50mm thick	CM	77.20	8,000	617,600





608	Supply and Construct Floor tiles of 40*40cm	SM	26.73	15,000	400,950
	S/Total				5,540,930
VII	SANITARY APPREANCES FITTING AND FIXTURES				
	The Contractor shall, install, to the manufacturer's recommendations, complete with clamps and all necessary fittings, the following fittings				
702	Supply and Fixe WC suite complete with cistern as specified	NO	8.00	350,000	2,800,000
703	Supply and Fixe Urinals with accessories	NO	6.00	120,000	720,000
704	Supply and Fix Wash Hand Basins with accessories for workability	NO	2.00	140,000	280,000
705	Supply and fix Frameless mirror (Type 1) 450 x 600mm	NO	2.00	75,000	150,000
706	Supply and Fix Soap Dispenser	NO	2.00	25,000	50,000
708	Supply and Fixes Water heater(40liters) with accessories	NO	2.00	650,000	1,300,000
	S/Total				5,300,000
VIII	DRAINAGE SYSTEM - PIPES AND FITTINGS AND PORTABLE EXTINGUISHERS				
801	The Contractor shall supply, install and connect up the following pipes to the satisfaction of the Engineer; Grease Trap as detailed out on drawing	ITEM	1.00	3,800,000	000,008′ε
802.1	5Kg Carbon dioxide fire extinguisher as NAFFCO CO2 gas extinguisher model NC5	NO	1.00	125,000	125,000
802.2	9kg dry powder portable fire extinguishers as NAFFCO ABC Model NP6 or equal approved to hose reel cabinets and selected areas	NO	1.00	145,000	145,000
	S/Total				4,070,000







	D			901	×
Bills of Quantities on Conversion of two court enclosure to three sand based	ELEMENT NO 4: CONSTRUCTION OF TWO BEACH VOLLEYBALL COURT WIT	GRAND TOTAL	S/Total	Supply and install all necessary fixtures of building electricity	Electrical Installation
based	YBALL CO			Item	
	URT WITH SPE			1	
	TH SPECTACLE VIEWING DESK			2,800,000	
	DESK	30,095,542	2,800,000	2,800,000	

302

retaining wall.

Tape for Geotextile membrane around perimeter IDL 0485 tape as recommended by and available from Terram. Sticks Geotextile to

Ξ

125.00

1,150

143,750

301

recommended by and available from Terram.

Tape for geotextile membrane jointing IDL 0485 tape as

202

Geotextile membrane Eg Terram with taped/sewn joints

MS

737.00

11,600

8,549,200

Ξ

216.00

1,780

384,480

MS

5.00

183,000

915,000

Ξ

214.00

4,500

963,000

201

geotextile membrane.

Soak away Assume 5m3 filled with aggregate and wrapped in

meters centres under courts.

Land Drains Assume required around perimeter, with runs at 10

103

102

500mm wide, 2 units per corner.

Retaining wall units (curved corner units) Oakland RB1500 barrier:

NO N

12.00

72,500

870,000

101

500mm wide by 1500mm long.

Retaining wall units (straight units) Oakland RB1500 barrier:

Unit

ΥD

unit price

Total Price

<u>N</u>

180.00

78,000

14,040,000

Item

volleyball court
Designation







402	401	< <	m		309	308	307	306	305	304	303
Timber Pavers of Size 2100x100x25mm laid on and including 50mm sand bed and compacted by surface vibration. The price includes the Kerbs where necessary nails and supports	Paths Leveling, compaction and 150mm thick hand packed stone base, well compacted including levelling as necessary to Engineer's approval	PAVING AND LANDSCAPING ON SPORTS AREA	ELEMENT NO 5: LAND SCAPING AND OLD TREES TREATMENT	TOTAL COST	Tape for court lines	Spectator viewing deck 1.5m wide, with handrail.	Timber steps assembly To form steps over barrier, 2000mm wide, including handrails. (Fixing excluded).	Timber skirting 250mm x 50mm, pressure impregnated, bolted to fence posts.	Sand to fill barriers Supplier: Hanson Aggregate, Product reference: Reigate / RB4 Blend.	Sand for courts Sand for courts Supplier: Hanson Aggregate, Product reference: Reigate / RB4 Blend.	Volleyball net assembly (N.B consider one fixed DRALO and 2no self-supply or standard nets instead) Includes: 2 external grade posts with, 2no.galvanized steel bases bolted to a cubic meter of concrete, 2 padlocks, Dralo Stainless steel net.
SM	SM		REES TREAT		M	SM	NO	M	CM	CM	NO
348.30	732.00				324	360	18	125	25	295	3.00
30,000	5,000		WITH PUBLIC LIGHT		8,700	125,000	42,800	4,700	69,600	69,600	1,840,000
10,449,000	3,660,000			102,834,130	2,818,800	45,000,000	770,400	587,500	1,740,000	20,532,000	5,520,000







GRAND TOTAL	x Supply concre		F ELEMEI		Mainta stay ofi get pro	Supply structu in varni wide, 4 sample	Supply feature	Plant G 404 organic	prepare in maxi turfing; 403 imports
	Supply and fix 5CM of water tank on height of 3M with station concrete footing plates and distribute water to the accessories.	WATER TANK	ELEMENT NO 6: WATER STORAGE AND DISTRUBITION SYSTEM	TOTAL FOR PAVING AND LANDSCAPING	Maintain and Fertilize, Insecticide, protect the bark, spread mulch, stay off roots, don't hang things from trees, water when it's dry, get professional inspection	Supply the Public Seat (Benches) of 4 people each made of Metal structure in 30x30 mm square tube Epoxy finish, seating and back in varnished wood (type libuyu) and Size: 3000mm Long, 400mm wide, 450 mm high from floor to seat area, 500mm high of back, sample to be Approved by Client or Consultant.	Supply and install golden and playground light with specific features approved by client	Plant Garden trees as well add imported vegetable soil and organic Fertilizer and well watering chosen by Client	prepared beds including the Filling in making up levels; depositing in maximum 200mm thick; levelling layers, Soiling, seeding or turfing; planting and well watering and Flowers as well add imported vegetable soil and organic Fertilizer
	LS				N O	ltem	ltem	pcs	MS
					∞	4	1	24	732
					12,500	250,000	4,600,000	10,000	1,500
3 600 000	2,600,000			21,147,000	100,000	1,000,000	4,600,000	240,000	1,098,000

SAMMARY PAGE

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CONSULTS

					TI	Е	D	С	В	Α	
GRAND TOTAL COST OF SPORTS AREA (VAT-INCLUSIVE)	ADD VAT 18%	TOTAL COST OF SPORTS AREA (VAT-EXCLUSIVE)	ADD CONTIGENCES 7%	SUB-TOTAL (Rwf)	ELEMENT NO 6: WATER STORAGE AND DISTRUBITION SYSTEM	ELEMENT NO 5: LAND SCAPING AND OLD TREES TREATMENT WITH PUBLIC LIGHT	ELEMENT NO 4: TWO BEACH VOLLEYBALL COURT WITH SPECTACLE VIEWING DESK	ELEMENT NO 3: CONSTRUCTION OF TOILET FACILITIES	ELEMENT NO 2: CONSTRUCTION OF CHANGING ROOM	ELEMENT NO 1: PRELIMINARIES AND LEVELLING WORKS	
<u>252,700,845</u>	38,547,586	214,153,258	14,010,026.24	200,143,232	2,600,000	21,147,000	102,834,130	30,095,542	33,890,560	9,576,000	







Annex2: Estimated cost for boat parking area

	ATTICAL LATITUDE COST TO A PORT PORT PORT PORT PORT PORT PORT PORT				
PARK	PARK BOAT LAUNCH - CITY OF RUBAVU PUBLIC BEACH				
NO	ITEM DESCRIPTION	UNIT	QTY	UNITY PRICE(Rwf)	TOTAL PRICE (Rwf)
Þ	ELEMENT NO 1: CONSTRUCTION OF FLOATING DOCK PARKING FACILITY				
	NOTE: all provisions and specifications contained in the preamble for trades are deemed to have been included in rates for all items here in				
A	SUPPLEMENTARY PREAMBLES				
	The Contractor shall prepare and submit in ample time for approval before execution of the Works detail drawings, specifications and calculations of all temporary Works they may wish to use, which shall also show the location of				
	such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen				
	running water and stream water.				
A.1	Excavations				
	The nature of the ground is assumed dumpy				
	Carting away of excavated material				
	Descriptions of carting away of excavated materials shall deemed to include loading excavated material into trucks directly from excavations or alternatively from excavations or				
201	Clearing and Grubbing the surface	MS	916		
203	Common Excavation on coast	S	229	0,000	0,000,000
203	Common excavation on coast	CZ	229	3,000	687,000
204	Rock Excavation,	CM	68.7	8,700	597,690
205	Pile Excavation under water to the level of workability	CM	86	17,000	1,462,000





222	221	220	219	218	217	216	215	214	213	212	211	210	209	208	207	206
12" Corr. Polyethlyene End Section,	Geotextile; Perm Control, Class 2, Non-Woven,	Stone Fill, Class C,	Reinforcing Steel pile, Epoxy Coated (Contractor Detailed),	Water Repellant (Silane-Siloxane),	Concrete Class B, Footings (On Soil)	Concrete Class A, Above Footings	Structural Fill,	Common Bridge Excavation of 62 M of Length	Supply and fixe Hot Bituminous Pavement, By using Machine Method,	Crushed Stone (Fine Gradation)	Crushed Gravel around piles	Gravel around piles	Fine Grading,	Granular Backfill (Bridge) : Return, fill and ram: selected excavated materials around PILE foundation	Common Structure Excavation Exploratory,	Fixing Embankment in Place Mentioned on Architectural Drawing
N _O	MS	CM	N _O	Ltr	CM	CM	CM	CM	MS	CM	CM	CM	ltem	CM	CM	CM
ω	879	149	48	19	26.7	22.8	22.9	84	23.6	11.4	474	948	1	84	38.2	38.2
	24,000	3,500	840,000	12,000	240,000	270,000	41,000	67,000	240,000	8,900	4,300	2,700	600,000	72,000	240,000	14,800
	21,096,000	521,500	40,320,000	228,000	6,408,000	6,156,000	938,900	5,628,000	5,664,000	101,460	2,038,200	2,559,600	600,000	6,048,000	9,168,000	565,360







				135,000	405,000
223	12" PE Pipe (Type S),	M	67	2,500	167,500
224	6" Perf. Corr. Polyethylene Pipe Underdrain	M	18.2	3,700	67,340
225	Ramp Handrail, Steel	LM	29		
366	Traffic Sign Type C	MS	n O	110,700	3,210,300
226	Traffic Sign Type C,	SM	50	14,000	700,000
227	Traffic Sign Type CC	MS	16.7		
				14,500	242,130
228	Maintenance of Traffic	Item	1	3,500,000	3,500,000
229	Boulders for Barricade	No	30	000 23	3 0 10 000
230	Loam	CM	305.8		
				10,800	3,302,640
231	Fertilizer for Re-fertilization	KG	326	6 400	2 086 400
232	Slope Seed (WF) Type 45,	KG	38		
				24,000	912,000
233	Wet Basin/Meadow Seed Type 62	KG	7.6	34,000	258,400
234	Turbidity Barrier	LM	50.3	71,400	3,591,420
235	Mulch with Tackifiers	ltem	Н	4,000,000	4,000,000
236	Erosion Stone	NOT	90)	
777	Character Polos for Tomasona (Fincing Control	2	ס	0,000	012,000
23/	Straw Bales for Temporary Erosion Control	NO	50	47,000	2,350,000
238	Silt Fence,	M	60.9	37,000	2,253,300





399,340,049				TOTAL COST ESTIMATION (VAT-EXCLUSIVE)	101/
36,303,641				ADD-CONTIGENCES 10%	ADD
363,036,408				SUB-TOTAL (Rwf)	SUB-
4,700,000	4,700,000	1	rs	250 Landscaping, trees care and walkways preparation on 916 Square Meters	250
31,000,000	31,000,000	-	5	249 Construction of deck Facilities building	249
19,499,000	170,000	7	7		2
		114.7	CM	Porous Media Reservoir Course,	248
3,000,000	3,000,000	1	Item	Remove and Reset Existing Headwall,	247
49,060,000	220,000	223	CM	246 Precast Concrete Block Gravity Retaining Wall,	246
24,000,000	24,000,000	1	Item	245 Boat Ramp,	245
102,000	34,000	ω	No	244 12" Diameter HDPE Area Drain,	244
1,629,340	8,200				
		198.7	CM	243 Bio retention Soil,	243
220,320	7,200	30.6	CM	242 Pea Stone,	242
4,625,000	185,000	25	CM	Precast Concrete Wheels top, for the unit price per each.	241
1,700,000	1,700,000	1	Item	240 Misc. Temporary Erosion and Sediment Control,	240
2,000,000	2,000,000	1	Item	239 Storm Water Pollution Prevention Plan	239



471,221,257.58	TOTAL COST ESTIMATION (VAT-INCLUSIVE)
71,881,208.78	ADD-VAT 18%











Annex3: Estimated cost for swimming area

Description Description			> 500	7 5 5 5 7	
Balancing tank 192 4.5 8,100		Description	(SM)	(LM)	Volume (CM)
Balancing tank		Pool (34M X 12M X (1.2M to 1.8M))	192	4.5	8,100
Filtration Time SHr 45 Min		Balancing tank			
Filtration Time Poscription			5Hr 45		
Description		Filtration Time	Min		
Description CRWf) Qty Amount (Rwf) RELEMENT NO 2: WATERSLIDE WITH FACILITIES			Unity		
ELEMENT NO 2: WATERSLIDE WITH FACILITIES SUPPLEMENTARY PREAMBLES The Contractor shall prepare and submit in ample time for approval before execution of the Works detail drawings, specifications and calculations of all temporary Works they may wish to use, which shall also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. Intermedia (Contract) Interme	tem No.	Description	(Rwf)	Qty	Amount (Rwf)
SUPPLEMENTARY PREAMBLES The Contractor shall prepare and submit in ample time for approval before execution of the Works detail drawings, specifications and calculations of all temporary Works they may wish to use, which shall also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT FILTRATION EQUIPMENT Filter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. No 2 1,5 Filter Media Kg 800 2 1,5 Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 No 3 101 Main Drain Grills. No 3 No 3		ELEMENT NO 2: WATERSLIDE WITH FACILITIES			
The Contractor shall prepare and submit in ample time for approval before execution of the Works detail drawings, specifications and calculations of all temporary Works they may wish to use, which shall also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. Filtrer: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. INLETS & OUTLETS No 3 No 3		SUPPLEMENTARY PREAMBLES			
before execution of the Works detail drawings, specifications and calculations of all temporary Works they may wish to use, which shall also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT FIIter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Kg 800 680 Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 80,460 INLETS & OUTLETS No 3 80,460		The Contractor shall prepare and submit in ample time for approval			
calculations of all temporary Works they may wish to use, which shall also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations , clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT FILTRATION EQUIPMENT Filter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filter Media Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No No No 3 No 3 No 3 No 3		before execution of the Works detail drawings, specifications and			
also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT Filter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 80,460 Main Drain Grills. No 3 80,460		calculations of all temporary Works they may wish to use, which shall			
execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT FILTRATION EQUIPMENT FIIter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 80,460 No 3 80,460 No 3 80,460		also show the location of such temporary Works and their order of			
upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Kg 800 680 Filter Media Filter Media Filter Media Filter Media Filter Media Filter Media No 3 80,460 Main Drain Grills.		execution. The rates to include allowance for maintaining and			
keeping the whole of the excavations free from general running water and stream water. FILTRATION EQUIPMENT Surface Finish, Max Operating Pressure Ghpsi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS No 316 Grade with suitable Starter. No 3 80,460 No 480,460		upholding sides of excavations, clear of all fallen material, rubbish and			
FILTRATION EQUIPMENT Filter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 80,460 INLETS & OUTLETS No 3 80,460		keeping the whole of the excavations free from general running water and stream water.			
Filter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 80,460 INLETS & OUTLETS No 3 80,460	ı	FILTRATION EQUIPMENT			
Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mmSurface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mmNo21,512,000Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia.No21,512,000Filter MediaKg800680680Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter.No380,460INLETS & OUTLETSNo380,460		Filter: Bobbin Wound Fibreglass Reinforced Filter Tank, UV Resistant			
Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release Valve, Six Way Rotatory Multiport Valve - 63mm dia. Filter Media Filter Media Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 80,460 INLETS & OUTLETS No 3 80,460	101	Surface Finish, Max Operating Pressure 36psi/ 2.5 bar, 32"/800mm			
Valve, Six Way Rotatory Multiport Valve - 63mm dia. No 2 1,5 Filter Media Kg 800 1 Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS No 3 316 Grade with suitable Starter. No 3 INLETS & OUTLETS No 3 Main Drain Grills. No 3		Dia, Flow Rate 24, 600 Ltrs./ Hr, Integral Pressure Guage, Air Release			
Filter Media Kg 800 Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 INLETS & OUTLETS No 3 No 3		Valve, Six Way Rotatory Multiport Valve - 63mm dia.	No	2	1,512,000
Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS 316 Grade with suitable Starter. No 3 INLETS & OUTLETS No 3 No 3	102	Filter Media	Kg	800	680
Sab Grade With Suitable Starter. No 3	103	Filtration Pumps: 2HP, 1 Ph Monoblock Pump with SS Pre Filter in SS			
INLETS & OUTLETS INCLUDE NO NO 3 201 Main Drain Grills. No 3	ŀ	316 Grade with suitable Starter.	No	ω	80,460
Main Drain Grills. No 3	=	INLETS & OUTLETS			
	201	Main Drain Grills.	No	3	80,460







	1	ı		T	1	1	I	ı	ı	ı			T	1			ı	ı	
502	c)	b)	a)	501	<	406	405	404	403	402	401	<	301	=	206	205	204	203	202
SS Grab Bars: Stainless Steel Grab Bars in SS 316 grade, 3 Feet length including Anchor Bolts & Nuts	SS Ladder for Baby Pool	SS Ladder for Pool (Deepest End)	SS Ladder for Pool (Shallow End)	SS Ladder: Hand Rails in Polished Stainless Steel Grade304,42mm dia Tube, including SS Steps with Non Slippery Rubber Pads, with Anchoring or Flange Fixture	SUPPORTING EQUIPMENT	2C X 2.50 Sq mm Flexible Electrical Cable	25mm Dia PVC Pipe (including Fittings)	Conduit for Underwater Lights (25mm Dia)	Deck Junction Boxes.	LED Driver : LED Driver (8.5 Amps) for Power Conversion AC to DC and Supply.	Underwater Lights Wall Mounted Light Fitting made in SS316, IP68 for Swimming Pools with 12V, 18W LED Lamp (WW/CW), Flat Wall Mounted.	UNDERWATER LIGHTING	Maintenance Kit including Flexible Hose Pipe (15 Mtrs), Vacuum Head, Telescopic Handle (7.2Mtrs), Flat Leaf Net, Deep Bag Net, Standard Wall Brush, Metal Algae Brush and Test Kit for Chlorine & pH.	MAINTENANCE ACCESSORIES	Inlet for First Filling & Overflow Lines	Corner Tiles for Gutter	Gutter Grating (10" Length).	Floor Inlets.	Vacuum Inlets.
N _o	No	No	No			Lm	Lm	No	No	N _o	N _O		ltem		Lm	No	No	No	No
4	1	1	1			425	375	14	ω	ω	14		Ь		45	14	16	4	3
147,160	359,100	502,200	405,000			3,520	2,560	16,740	27,180	124,200	350,320		627,760		1,506,600	453,600	32,400	32,400	32,400
588,640	359,100	502,200	405,000			1,496,000	960,000	234,360	81,540	372,600	4,904,480		627,760		67,797,000	6,350,400	518,400	129,600	97,200







805A 110mm Dia	804A 90mm Dia	803A 75mm Dia	802A 63mm Dia	801A 25mm Dia	800A Make suitable of pressure rating of Rating of 16Kg/S	PVC PIPES & FITT	IX PLUMBING & ELI	Consultation, Gu Sectional, Plumb	Representative ii	Underwater Ligh	Inlets & Commiss	lights Ladders (VIII INSTALLATION 8	for Inlets, Outlet	701 Control Valves: S	VII CONTROL VALVES	603 Conduit for Over	602 Conduit for Balar	601 Conduit for Vacu	VI PVC CONDUITS (10Kg Pressure)
					Make suitable of PVC Pipes for Water Suction & Delivery Lines with a pressure rating of 10Kg/Sqcm including PVC Fittings with a Pressure Rating of 16Kg/Sqcm (PN 16) and Adhesives & Consumables.	PVC PIPES & FITTINGS: Supply of Supreme/ Finolex/ Ajay/ Equivalent	PLUMBING & ELECTRICAL MATERIAL FOR SWIMMING POOL	Consultation, Guidance in the Pool Construction, Drawings (Schematic, Sectional, Plumbing, Electrical & As Built)	Representative in Filtration and Maintenance Operations including	Underwater Lights & Motors & Fixing of Conduits, Training of	Lights & Commissioning Taying of PVC Pipes Electrical Cabling for	Installation of Filters, Motors, Inlets, Outlets, Underwater	INSTALLATION & COMMISSIONING	for Inlets, Outlets, Pumps Interconnections in Plant Room	Control Valves: Supply of CEPEX Make Ball Valves & Non Return Valves	iS .	Conduit for Overflow Lines (110mm Dia)	Conduit for Balancing Tank & Plant Room (110mm Dia)	Conduit for Vacuum Points & First Filling Lines (63mm Dia)	10Kg Pressure)
Lm	Lm	Lm	Lm	Lm				Item						Item			No	No	No	
45	5	95	135	20				Ь						1			1	2	6	
00,700	26,980	19,720	14,180	5,140				1,890,000						1,757,700			50,220	50,220	23,900	
2,731,500	134,900	1,873,400	1,914,300	102,800				1,890,000						1,757,700			50,220	100,440	143,400	







0	FIECTRICAL CARIE: Sumply of Flexible Flectrical Copper Cable for				
0000	Underwater Lights. Make: Finolex/ RR Kable/ Polycab				
801B	3C X 2.50 Sqmm	Lm	25	4320	108,000
901	TILING : Supply of Regular Blend Mosaic Tiles and laying with Adhesive and Finishing with White Groote. Regular Blends of Mosaic Tiles (Make: Pino & MYK Laterite)	MS	3,100	4,460	13,826,000
XI	DOSING SYSTEM				
102	Dosing Tank with 100 Ltrs Capacity	No	2	314,020	628,040
103	Stirring Rod	SM	2	186,300	372,600
104	TCCA 90 Chlorine Granules (50 Kgs x 2 Cans)	Kg	100	8,240	824,000
105	Alum	Kg	25	1,460	36,500
106	Sodium Bi-Sulphite	Kg	25	1,760	44,000
107	Sodium Bi-Carbonate	Kg	10	2,020	20,200
XII	CONTROL PANEL				
201	Indoor Control Panel (600mm X 500mm X 200mm)	No	1	2,362,500	2,362,500
XII	BEACH EMBRELLA SUN SHELTER				
301	AMMSUN TS 710019-DL-200 UV50 Protection, Lightweight, Portable & Easy, Perfect, Camping, Sports, Garden, 6.5 Ft outdoor Patio Beach Umbrella Sun Shelter With Sand Anchor Fringe, Blue Color.	No	20	600,000	12,000,000
Υ	FIBRO POOL FULL-SIZED SWIMMING POOL SLIDE				
401	Full-sized white. Left Curved. Seat is 6 Feet above Deck Surface. Runway is 10 feet 6 inches long. All stainless steel Legs and Ladder. Includes surface in out Hardware, only drill and screw down. Super strong, mesh fiber glass backing with gelcoat surface. A large sprayer with 1/2" Feeder hose allows all the water supply needed.	ltem	1	4,200,000	4,200,000







402	Supply the Public Seat (Benches) of 4 people each made of Metal structure in 30x30 mm square tube Epoxy finish, seating and back in varnished wood (type libuyu) and Size: 3000mm Long, 400mm wide, 450 mm high from floor to seat area, 500mm high of back, sample to be Approved by Client or Consultant	ltem	4	250,000	1,000,000
403	Construction of waterslide Facilities with Exhibition Center	LS	1	38,000,000	38,000,000
SUB-TOTAL (Rwf)	L (Rwf)				173,595,540
ADD-CONT	ADD-CONTIGENCES 15%				26,039,331
TOTAL COS	TOTAL COST (VAT EXCLUSIVE)				199,634,871







Annex4: Cost estimation for Kid's park area

21,914,500					
				TOTAL FOR PAVING AND LANDSCAPING	
537,500	12,500	43	NO	Maintain and Fertilize, Insecticide, protect the bark, spread mulch, stay off roots, don't hang things from trees, water when it's dry, get professional inspection	406
4,600,000	4,600,000	1	ltem	Supply and install golden and public lighting with specific features approved by client	405
240,000	10,000	24	pcs	Plant Garden trees as well add imported vegetable soil and organic Fertilizer and well watering (Jacaranda, Acacia, Avocado, Palmier etc., to be chosen by Client)	404
1,098,000	1,500	732	SM	Turf grass sprigs; planting at 50mm centres in both directions in prepared beds including the Filling in making up levels; depositing in maximum 200mm thick; levelling layers, Soiling, seeding or turfing; planting and well watering and Flowers as well add imported vegetable soil and organic Fertilizer	403
10,449,000	30,000	348.30	SM	Timber Pavers of Size 2100x100x25mm laid on and including 50mm sand bed and compacted by surface vibration. The price includes the Kerbs where necessary nails and supports	402
4,990,000	5,000	998.00	SM	Paths Leveling, compaction and 150mm thick hand packed stone base, well compacted including levelling as necessary to Engineer's approval	401
				PAVING AND LANDSCAPING ON KIDS PARK AREA	V
	SHT	T WITH PUBLIC LIGHT	REATMENT	ELEMENT NO 5: LAND SCAPING AND OLD TREES TREATMENT WIT	ш

Item	
Designation	ELEMENT NO 2: BILLS OF COST ESTIMATION OF KIDS PARK EQUIPMEN
Unit	ARK EQUIF
QTY	MENT
unit price	
Total Price	







						103	102	101	_
104						3	2	1	
Construction of kids park Facilities with Exhibition Center	Seesaws play equipment with 360 degrees Sturdy steel frame construction with attractive colors and all necessary works to be completed as per engineer's instructions.	Springers	Swings (Triple Swinger)Swing set with 2 swing seats, 1 glider, 1 slide for up to 5 children of age from 3 to 8 years old at once, the price includes all required works, fittings, parts and installation of Safe and Strong Steel-Pole Construction, Passes playground performance in accordance of ASTM safety standards as per approved by the Engineer	Slide	The Puzzle Play Ground	Supply and Install Playground made from Fiberglass,: The work shall include supplying, installation and of high quality children playground equipment as per drawings and comply with ASTM F1487-07 specifications. The price includes shall include installation of Vinyl flooring texture with (4 mm thickness, persons traffic resistance, environment friendly materials, walking comfort as per approved by the District Engineer. also will be laid on Plain Concrete 10 cm for each equipment. and all associated works to be complete. The following items shall be included	PLAYGROUND AREA (OUTDOOR)	Supply and Installation of Outdoor Bench for 4 seats as per the following specification: Colour: Wooden Colour, the Iron Black; Design Type: To be Customized; Material: Wood and Iron; Weight: 35 kg; Dimension: L 2020 mm x W 640 mm x H 815 mm	SUPPLY AND INSTALLATION OF OUTDOORS BENCHES
LS	3	4	4	4	1	Package		ltem	
1						1.00		1.00	
38,000,000								550,000	
38,000,000						16,000,000		550,000	







COST ESTIMATION OF PLAYGROUND AREA (OUTDOOR)	54,550,000
TOTAL COST OF KIDS PARK	76,464,500
ADD-CONTIGENCES 15%	3,823,225
TOTAL COST (VAT EXCLUSIVE)	80,287,725
ADD VAT 18%	14,451,790.50
GRAND TOTAL COST OF KIDS PARK AREA (VAT-INCLUSIVE)	94.739.516
	94,739,516







Annex5: Cost estimation for Event area

32,777,000				TOTAL FOR PAVING AND LANDSCAPING	
400,000	12,500	32	NO	Maintain and Fertilize, Insecticide, protect the bark, spread mulch, stay off roots, don't hang things from trees, water when it's dry, get professional inspection	406
4,600,000	4,600,000	1	ltem	Supply and install garden and Public lighting with specific features approved by client	405
240,000	10,000	24	pcs	Plant Garden trees as well add imported vegetable soil and organic Fertilizer and well watering (Jacaranda, Acacia, Avocado, Palmier etc., to be chosen by Client)	404
1,098,000	1,500	732	SM	Turf grass sprigs; planting at 50mm centres in both directions in prepared beds including the Filling in making up levels; depositing in maximum 200mm thick; levelling layers, Soiling, seeding or turfing; planting and well watering and Flowers as well add imported vegetable soil and organic Fertilizer	403
10,449,000	30,000	348.30	SM	Timber Pavers of Size 210x100x20mm (minimum strength 35N per square mm) laid on and including 50mm sand bed and compacted by surface vibration. The price includes the Kerbs where necessary nails and supports	402
7,590,000	5,000	1,518	SM	Paths Leveling, compaction and 150mm thick hand packed stone base, well compacted including levelling as necessary to Engineer's approval	401
8,400,000	8,400,000	12	S	Supply and fix fountain (water fall), with an aesthetic entry view refer to architectural design and approved by client.	400
				PAVING AND LANDSCAPING ON EVENTS PARK AREA	<
\CILITIES	LIGHT AND OTHER FACILITIES		EATMENT WI	ELEMENT NO 1: LAND SCAPING AND OLD TREES TREATMENT WITH PUBLIC	m
				Allicand. Cost costillation for Excit alica	7111070







_		103 S	102 S	101 S	I E	ltem [
	TOTAL COST OF TENTE	Supply and fix high quality Alluminium big tent of wedding party tents of standard cocktail of 380 - 470 with white colour for 200 people capacity Equipped with furniture (aesthetic Dining tables and desks), floor finishes and wedding ceiling aestatic view.	Supply and fix high quality aluminum big tent of wedding party tents of standard cocktail of 16 - 20 with white colour for 20 people capacity Equipped with furniture (aesthetic Dining tables and desks), floor finishes and wedding ceiling aesthetic view.	Supply and fix high quality Alluminium big tent of wedding party tents of standard cocktail of 380 - 470 with white colour for 200 people capacity Equipped with furniture (aesthetic Dining tables and desks), floor finishes and wedding ceiling view.	EVENTS TENT	Designation	ELEMENT NO 2: BILLS OF COST ESTIMATION OF EVENT TENTS
		MS	MS	SM		Unit	N OF EVENT
		223.00	9.80	223.00		QTY	TENTS
		485,000	485,000	485,000		unit price	
221,063,000		108,155,000	4,753,000	108,155,000	•	Total Price	

ITEM NO	ITEM DESCRIPTION ELEMENT NO 3: CONSTRUCTION OF FLOATING DOCK PARKING FACILITY FOR HEAVY BOATS	UNIT	QTY PRICE(Rwf)
	NOTE: all provisions and specifications contained in the preamble for trades are deemed to have been included in rates		
A			







			1					Т	1		I	Т
209	208	207	206	205	204	203	201				A.1	
Fine Grading,	Granular Backfill (Bridge): Return, fill and ram: selected excavated materials around PILE foundation	Common Structure Excavation Exploratory,	Fixing Embankment in Place Mentioned on Architectural Drawing	Pile Excavation under water to the level of workability	Rock Excavation,	Common Excavation on coast	Clearing and Grubbing the surface	Descriptions of carting away of excavated materials shall deemed to include loading excavated material into trucks directly from excavations or ,alternatively, from stock piles situated on the building site	Carting away of excavated material	The nature of the ground is assumed dumpy	Excavations	The Contractor shall prepare and submit in ample time for approval before execution of the Works detail drawings, specifications and calculations of all temporary Works they may wish to use, which shall also show the location of such temporary Works and their order of execution. The rates to include allowance for maintaining and upholding sides of excavations, clear of all fallen material, rubbish and keeping the whole of the excavations free from general running water and stream water
Item	CM	CM	CM	CM	CM	CM	SM					
ъ	48	19	29	52	46.2	154	616					
300,000	72,000	240,000	14,800	17,000	8,700	3,000	3,500					
	3,456,000	4,560,000	429,200	884,000	401,940	462,000	2,156,000					







225	224	223	222	221	220	219	218	217	216	215	214	213	212	211	210	
Ramp Handrail, Steel	6" Perf. Corr. Polyethylene Pipe Underdrain	12" PE Pipe (Type S),	12" Corr. Polyethylene End Section,	Geotextile; Perm Control, Class 2, Non-Woven,	Stone Fill, Class C,	Reinforcing Steel pile, Epoxy Coated (Contractor Detailed),	Water Repellant (Silane-Siloxane),	Concrete Class B, Footings (On Soil)	Concrete Class A, Above Footings	Structural Fill,	Common Bridge Excavation of 62 M of Length	Supply and fixe Hot Bituminous Pavement, By using Machine Method,	Crushed Stone (Fine Gradation)	Crushed Gravel around piles	Gravel around piles	
M	M	L	N _o	MS	CM	No	Ltr	CM	CM	CM	CM	MS	CM	CM	CM	
19	9.4	34	2	635	83	44	22	18.7	10.8	12.9	48	18	6.4	286	487	
110,700	3,700	2,500	135,000	24,000	3,500	840,000	12,000	240,000	270,000	41,000	67,000	240,000	8,900	4,300	2,700	
2,103,300	34,780	85,000	270,000	15,240,000	290,500	36,960,000	264,000	4,488,000	2,916,000	528,900	3,216,000	4,320,000	56,960	1,229,800	1,314,900	300,000







242	241	240	239	238	237	236	235	234	233	232	231	230	229	228	227	226
Pea Stone,	Precast Concrete Wheels top, for the unit price per each.	Misc. Temporary Erosion and Sediment Control,	Storm Water Pollution Prevention Plan	Silt Fence,	Straw Bales for Temporary Erosion Control	Erosion Stone	Mulch with Tackifiers	Turbidity Barrier	Wet Basin/Meadow Seed Type 62	Slope Seed (WF) Type 45,	Fertilizer for Re-fertilization	Loam	Boulders for Barricade	Maintenance of Traffic	Traffic Sign Type CC	Traffic Sign Type C,
CM	CM	Item	Item	Z	Z _o	TON	ltem	Z	KG	KG	KG	CM	N _o	Item	SM	MS
17	15	1	1	30.9	28	50	ъ	30.3	4.6	29	214	216	16	1	19	26
7,200	185,000	850,000	1,000,000	37,000	47,000	6,800	2,000,000	71,400	34,000	24,000	6,400	10,800	67,000	1,750,000	14,500	14,000
122,400	2,775,000	850,000	1,000,000	1,143,300	1,316,000	340,000	2,000,000	2,163,420	156,400	696,000	1,369,600	2,332,800	1,072,000	1,750,000	275,500	364,000







243	Bio retention Soil,	CM	98.7	8,200	809,340
244	12" Diameter HDPE Area Drain,	No	1.8	34,000	61,200
245	Boat Timber Ramp,	ltem	ב	12,000,000	12,000,000
246	Precast Concrete Block Gravity Retaining Wall,	CM	223	220,000	49,060,000
247	Remove and Reset Existing Headwall,	ltem	₽	1,500,000	1,500,000
248	Porous Media Reservoir Course,	CM	87.2	170,000	14,824,000
249	Construction of deck Facilities building	LS	1	20,000,000	20,000,000
	(
SUB-TOTAL (Rwf)	AL (Rwf)				203,948,240
ADD-CON	ADD-CONTIGENCES 10%				20,394,824.00
TOTAL CO	TOTAL COST ESTIMATION(VAT-EXCLUSIVE)				224,343,064
	SAMMARY PAGE				Rwf
Α	ELEMENT NO 1: ELEMENT NO 1: LAND SCAPING AND OLD TREES TREATMENT WITH PUBLIC OTHER FACILITIES	REATMENT WI		LIGHT WITH	32,777,000





-		
	ELEMENT NO 2: BILLS OF COST ESTIMATION OF EVENT TENTS	
В		221,063,000
	ELEMENT NO 3: CONSTRUCTION OF FLOATING DOCK PARKING FACILITY FOR HEAVY BOATS	
С		224,343,064
SUB-TOTAL (Rwf)	AL (Rwf)	
		478,183,064
ADD COI	ADD CONTIGENCES 7%	33,472,814.48
ТОТАL С	TOTAL COST OF EVENTS AREA (VAT-EXCLUSIVE)	511,655,878
ADD-VAT 18%	Π 18%	92,098,058
TOTAL C	TOTAL COST OF EVENTS AREA (VAT-INCLUSIVE)	603,753,937







Annex6: Cost Estimation for Car parking area

	BILLS OF QUANTITIES FOR SECURITY HOUSE			
Item	Designation	Unit	QTY	Unit Price (
ı	FOUNDATION			
101	Excavation of Foundation trenches and footings and remove the Excavated soil to the dump site	СМ	8.68	3,000
102	Plain concrete(Bottom and top of foundation) 50mm thick using ratio of 250kg /m3	СМ	0.73	110,00
103	Foundation in stones joined by mortar cement proportioned with 300Kg/m3. The faces remaining visible will have to be assembled carefully in apparent masonry including the well compacted back fill.	СМ	3.38	55,00
	S/Total			
II	WALLING			
201	Damp proof Course (Roofing)	lm	9.40	1,000
202	Walling with burnt bricks, 20 cm thick, built in cement and sand mortar with 300Kg/m3. with straight horizontal and vertical joints, regular form, Pointed with mortar at external	СМ	5.83	60,00
	S/Total			
III	CONCRETE WORKS			







	T	<u> </u>					<u> </u>
403	402	401	₹		305	304	301
Supply BA iron sheets BG28 roof cover in black color and fix them to trusses	Supply, screws, and assemble structural Steel trusses as indicated in structural drawings, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client): 40x40x1.5 rectangular	Supply, screws, and assemble structural Steel trusses as indicated in structural drawings, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client): 40x40x1.5mm	ROOF STRUCTURE AND COVER	S/Total	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for ring beam. Formwork Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for foundations (footings), sub-columns, and columns Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	Vibrated reinforced concrete class25/30 with 20mm maximum diameter aggregate for ground beam and Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.
SM	ਭ	m			CM	CM	CM
14.98	11.70	24.00			0.38	1.07	0.38
10,000	4,000	4,000			300,000	300,000	300,000
149,760	46,800	96,000		547,200	112,800	321,600	112,800







	_							_	
601	VI		502	501	٧		406	405	404
Apply plaster, first coat cement and sand (1:3); second coat of cement,(1:2) steel travelled includes internal wall, external wall and columns and beams	WALL, FLOOR AND CEILLING FINISHING	S/Total	Supply and installation of metallic door of 800mmx2400mm. The price includes glassing with 6mm clear glass thickness and grilling with 20x20mm metal tubes	Supply and install a hung metallic windows of 600 mm height and 700mm wide with 6mm thick clear glazed panel. Referring the Details to the Windows & Doors Schedule drawing	DOORS AND WINDOWS	S/Total	Rainwater installations 'U.P.V.C. Pipes, gutters and fittings, Pipes with solvent welded joints fixed to walls with holder bats (140), including Extra for outlet in pipe, Extra for shoe in pipe, Galvanized steel wire balloon grating wrapped in mosquito gauze and set in pipe diameter - 110 mm (PN6)	Supply and fix gutters 200*150*150mm, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client)	Supply and fix facial board, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client)
NS			ltem	ltem			M	lm	lm
29.14			1.00	2.00			12.00	3.90	10.30
5,000			115,200	40,000			4,000	8,000	10,000
145,700		195,200	115,200	000′08		474,760	48,000	31,200	103,000





Total Price	unit price	QTY	Unit	Designation	Item
		SXS	TERNAL WOI	BILLS OF QUANTITIES FOR EXTERNAL WORKS	
3,124,093				GRAND TOTAL	
1,255,845				S/Total	
187,200	15,000	12.48	SM	Floor Finishes with Cement and sand (1:3) screeds, of 50mm thick	608
262,080	210,000	1.25	CM	Ground slab of 100mm thick embedded with A142 fabric mesh concrete Floor Finishes with Cement, sand and Aggregates (1:1:2) screeds, of 100mm thick	607
284,000	20,000	14.20	M	Outside drainage works in stone hardcore and concrete (non-reinforced) of 50mm thick lean concrete mix, 50cm apron around the building and U shape drain of 35cm includes the cover of U shape drain made in angle iron 40x40 and steel bars of 16mm diameter with 20mm spacing	606
49,920	20,000	2.50	CM	200mm thick well compacted hardcore filling with quarry dust layer to receive surface bed	605
87,420	3,000	29.14	SM	Prepare and apply three coats of first grade of Silky Vinyl paint on internal lintel, beam, columns and plastered internal area	604
56,400	3,000	18.80	LM	Prepare and apply three coats of first grade Emulsion paint on Internal and external skirting	603
94,000	5,000	18.80	LM	Internal and external skirting in cement mortar of 100mm high	603
89,125	5,000	18	MS	Pointing works with cement mortar on external wall burnt bricks	602







301	111		206	205	204	203	201	200
Excavation of Foundation trenches	FENCING	TOTAL FOR PRELIMINARIES AND LEVELLING WORKS	Antitermite (Termidal), treatment to sides, bottoms of excavation, and softs of hardcore, all site treatment to remove all insects in soil	Backfilling with laterites or stone base and compaction of all site as approved by Client for Levelling of Site (compaction must be at least the 95% of optimum Modified Proctor result)	DUMP SITE (dump site to be determined and paid by Contractor under supervision of Environment protection District unit): After landfilling in dump site, Contractor must develop the dump site (compaction and greening the site or any other method to avoid soil sliding) for environment protection	Site Levelling, the price includes Soil Excavation for levelling and Soil removal (transport) to the dump site	Site Clearing and removal of trees, grasses, Vegetable soil etc. to the Dump site)	PRELIMINARIES AND LEVELLING WORKS Site installation including site hoarding, site offices with all furniture's, Avail drinking water on the site, site sanitation and cleaning during execution, Site signage, latrines and site documents such as drawings, copy of site insurance, site Log (journal de chantier), attachments book, Order books (Site communications), Attendance register and Stock records, safety workers, site shelters during the execution period.
СМ	3)	IRKS	NS WS	d CM	y LS n or e e	g CM	SM	22
493.20	•		7,660.00	3,034.50	1.00	1,405.20	4,684.00	1.00
3,000			1,000	15,000	2,000,000	3,000	1,000	4,000,000
1,479,600		68,077,100	7,660,000	45,517,500	2,000,000	4,215,600	4,684,000	4,000,000







item 1.00
item 1.00
1644
10960
41.40
CM 328.80
CM 13.70
CM 16.44







222,934,102.65				TOTAL COST ESTIMATION(VAT-EXCLUSIVE)	тотац со
10,615,909.65				ADD-CONTIGENCES 5%	ADD-CON
212,318,193				GRAND TOTAL	
74,950,000				TOTAL FOR PAVING AND LANDSCAPING	TOTAL FO
9,450,000	1,500	6,300	MS	Turf grass sprigs; planting at 50mm centres in both directions in prepared beds including the Filling in making up levels; depositing in maximum 200mm thick; levelling layers, Soiling, seeding or turning; planting and well watering and Flowers as well add imported vegetable soil and organic Fertilizer	404
1,500,000	250,000	6.00	ltem	Supply the Public Seat (Benches) of 4 people each made of Metal structure in 30x30 mm square tube Epoxy finish, seating and back in varnished wood (type libuyu) and Size: 3000mm Long, 400mm wide, 450 mm high from floor to seat area, 500mm high of back, sample to be Approved by Client or Consultant	401
48,000,000	15,000	3,200.00	SM	Concrete Pavers of Size 210x100x75mm (minimum strength 45N per square mm) laid on and including 50mm sand bed and compacted by surface vibration. The price includes the Kerbs where necessary	402
16,000,000	5,000	3,200.00	SM	Parking and paths Leveling, compaction and 150mm thick hand packed stone base, well compacted including levelling as necessary to Engineer's approval	401
				PAVING AND LANDSCAPING	V



GRAND TOTAL COST (VAT ENCLUSIVE) ADD-VAT 18% 263,062,241.13 40,128,138.48











Annex7: Cost estimation for Visitor Centre

	BILLS OF QUANTITIES FOR VISITORS CENTRE	S CENTRE			
Item	Designation	Unit	QTY	unit price	Total Price
_	FOUNDATION				
101	Excavation of Foundation trenches and footings and remove the Excavated soil to the dump site	CM	20.84	3,000	62,532
102	Plain concrete(Bottom and top of foundation) using a ratio of 250kg/m3	CM	1.99	110,000	219,120
103	Foundation in stones joined by mortar cement proportioned with 300Kg/m3. The faces remaining visible will have to be assembled carefully in apparent masonry including the well compacted back	CM	10.01	55,000	550,440
	S/Total				832,092
II	WALLING				
201	Damp proof Course (Roofing)	lm	27.80	1,000	27,800
202	Walling with burnt bricks, 20 cm thick, built in cement and sand mortar with 300Kg/m3. with straight horizontal and vertical joints, regular form, Pointed with mortar at external and internal side of walls	CM	29.36	60,000	1,761,840
	S/Total				1,789,640
≡	CONCRETE WORKS				
301	Vibrated reinforced concrete class 25/30 with 20mm aggregate for ground beam and its Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	CM	1.39	300,000	417,000







Supply and in wide. wooder and the trans lock system	Supply and install of m includes glassing with 20x20mm metal tubes	Supply and in 1500mm wide Details to the	V DOORS AND WINDOWS	Reinforced Co concrete (1:1 admixtures. <i>A</i> installations i	IV ROOF STRUC		301 Vibrated rein for lintel. reinforcemen required.	302 Vibrated rein for foundati Dismantling, hooking, tying
Supply and install a flush door of 2400mm height and 900 mm wide. wooden frame with aluminum protection @ the bottom and the transom to be filled with 6mm thick clear glass including lock system	Supply and install of metallic door of 900mmx2500mm. The price includes glassing with 6mm clear glass thickness and grilling with 20x20mm metal tubes	Supply and install Aluminum windows of 1500 mm height and 1500mm wide with 6mm thick clear glazed panel. Referring the Details to the Windows & Doors Schedule drawing	WINDOWS	Reinforced Concrete Roof with 25MPa Vibrated reinforced concrete (1:11/2:3) class 25: with master seal 550 water proofing admixtures. Allow material & Labor for Concrete Roof installations including insulations and finishing works.	ROOF STRUCTURE AND COVER	S/Total	Vibrated reinforced concrete class 25/30 with 20mm aggregate for lintel. Formwork Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	Vibrated reinforced concrete class 25/30 with 20mm aggregate for foundations, sub-columns, columns and its Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.
ltem	ltem	ltem		ltem			MO	CM
1.00	2.00	3.00		1.00			1.39	1.52
420,000	260,000	135,000		7,000,000			000′00€	300,000
420,000	520,000	405,000		7,000,000		874,200	417,000	457,200







608	607	606	605	604	603	602	601	≤		507
Floor Finishes with Tiles of 60x60cm	Ground slab of 100mm thick embedded with A142 fabric mesh concrete Floor Finishes with Cement, sand and Aggregates (1:1:2) screeds, of 100mm thick	Outside drainage works in stone hardcore and concrete (non-reinforced) of 50mm thick lean concrete mix, 50cm apron around the building and U-shaped drain of 35cm includes the cover of U shape drain made in angle iron 40x40 and steel bars of 16mm diameter with 20mm spacing	Prepare and apply three coats of first grade of Silky Vinyl paint on internal lintel, beam, columns and plastered internal area	Prepare and apply three coats of first grade Emulsion paint on Internal and external skirting	Internal and external skirting in cement mortar of 100mm high	Pointing works with cement mortar on external wall volcanic dressed stones	Apply plaster, first coat cement and sand (1:3); second coat of cement, (1:2) steel trawled includes internal wall, external wall and columns and beams	WALL, FLOOR AND CEILLING FINISHING	S/Total	Supply and install of aluminum double door of 160mmx2500mm. The price includes glassing with 6mm clear glass thickness and grilling with 20x20mm metal tubes
SM	CM	ā	MS	LM	LM	SM	SM			ltem
53.00	5.30	31.20	161.16	55.60	55.60	24.00	161.16			2.00
45,000	210000	20000	5,500	3,800	5600	7,500	8,700			260,000
2,385,000	1,113,000	624,000	886,380	211,280	311,360	180,000	1,402,092		1,865,000	520,000





609	Supply and fix exhibition materials and all necessary accessories	Ŋ	1.00	4,000,000	4,000,000
	S/Total				11,113,112
TOTAL COST(Rwf)	ST(Rwf)				15,483,244
ADD-CONT	ADD-CONTIGENCIES 5%				774,162
TOTAL CO	TOTAL COST(VAT-EXCLUSIVE)				16,257,406
ADD-VAT 18%	18%				2,926,333.12
GRAND TO	GRAND TOTAL COST ESTIMATION				19,183,739







Annex8: Cost Estimation for Coffee shop

		,			
	BILLS OF QUANTITIES FOR COFFESHOP	SHOP			
Item	Designation	Unit	QTY	unit price	Total Price
-	FOUNDATION				
101	Excavation of Foundation trenches and footings and remove the Excavated soil to the dump site	CM	22.57	3,000	67,716
102	Plain concrete(Bottom and top of foundation) using a ratio of 250kg/m3	CM	2.18	110,000	240,240
103	Foundation in stones joined by mortar cement proportioned with 300Kg/m3. The faces remaining visible will have to be assembled carefully in apparent masonry including the well compacted back fill.	CM	11.16	55,000	613,800
	S/Total				921,756
=	WALLING				
201	Damp proof Course (Roofing)	lm	26.50	1,000	26,500
202	Walling with burnt bricks, 20 cm thick, built in cement and sand mortar with 300Kg/m3. with straight horizontal and vertical joints, regular form, Pointed with mortar at external and internal side of walls	CM	17.49	60,000	1,049,400
	S/Total				1,075,900
=	CONCRETE WORKS				
301	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for ground beam and its Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	CM	1.40	300,000	420,000







84,000	4,000	21.00	Ī	Supply and fix facial board, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client)	405
102,000	10000	10.20	ā	Supply and fix gutters 300*200*200mm, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client)	404
660,960	10000	66.10	SM	Supply BA iron sheets BG28 roof cover color to be approved by District and fix them to trusses	403
198,400	4,000	49.60	Īπ	Supply, screws, and assemble structural Steel trusses as indicated in structural drawings, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client): 40x40x1.5 rectangular	402
345,600	4,000	86.40	Īπ	Supply, screws, and assemble structural Steel trusses as indicated in structural drawings, Prepare and apply anti rust Two coats and three coats of first grade plastic emulsion paint (color to be approved by client): 40x40x1.5mm	401
				ROOF STRUCTURE AND COVER	V
828,000				S/Total	
382,500	300,000	1.28	CM	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for lintel. Formwork Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	301
408,000	300,000	1.36	CM	Vibrated reinforced concrete class 25/30 with 20mm maximum diameter aggregate for foundations, sub-columns, columns and its Formwork. Dismantling, supply, fixing steel reinforcement, cutting, bending, hooking, tying and supporting as required.	302







	T	ı	1					1	ı	
602	601	≤		505	504	502	501	<		406
Painting works with cement mortar on external wall burnt bricks	Apply plaster, first coat cement and sand (1:3); second coat of cement,(1:2) steel troweled includes internal wall, external wall and columns and beams	WALL, FLOOR AND CEILLING FINISHING	S/Total	Supply and install a flush solid panel door of 2100mm height and 900 mm wide. wooden frame including lock system	Supply and install of Alluminium door of 900mmx2100mm. The price includes glassing with 6mm clear glass thickness and grilling with 20x20mm metal tubes	Supply and install a hung Alluminium windows of 600 mm height and 700mm wide with 6mm thick clear glazed panel. Referring the Details to the Windows & Doors Schedule drawing	Supply and install Alluminium windows of 1200 mm height and 1000mm wide with 6mm thick clear glazed panel. Referring the Details to the Windows & Doors Schedule drawing	DOORS AND WINDOWS	S/Total	Rainwater installations 'U.P.V.C. Pipes, gutters and fittings Pipes with solvent welded joints fixed to walls with holder bats (140), including Extra for outlet in pipe, Extra for shoe in pipe, Galvanized steel wire balloon grating wrapped in mosquito gauze and set in pipe diameter - 110 mm (PN6)
SM	SM			Item	Item	Item	ltem			LM
72.60	113.85			2.00	2.00	1.00	2.00			12.00
6,200	7,500			240,000	720,000	280,000	360,000			4000
450,120	853,875		2,920,000	480,000	1,440,000	280,000	720,000		1,438,960	48,000







611	610	609	608	607	606	605	604	603
Supply high filling cabinet made in MDF wood shelves of 2000mm high, 1500mm long and 400mm wide divided into three equal part at long. with rubber feet, sample to be Approved by Client or Consultant	Ground slab of 100mm thick embedded with A142 fabric mesh concrete Floor Finishes with Cement, sand and Aggregates (1:1:2) screeds, of 100mm thick	Outside drainage works in stone hardcore and concrete (non-reinforced) of 50mm thick lean concrete mix, 50cm apron around the building and U-shaped drain of 35cm includes the cover of U shape drain made in angle iron 40x40 and steel bars of 16mm diameter with 20mm spacing	Supply and fix non-slip ceramic floor tiles 400x400mm in bath room and cleaning room includes 32mm bed finished to receive ceramic floor tiles, First grade imported ceramic floor tiling of approved quality and approved surface texture finish	Supply and fix 250*400 x 6mm thick ceramic glazed wall tiles to walls on prepared backgrounds includes 12mm render finished to receive ceramic wall tiles for Bathrooms	200mm thick well compacted hardcore filling with quarry dust layer to receive surface bed	Prepare and apply three coats of first grade of Silky Vinyl paint on internal lintel, beam, columns and plastered internal area	Prepare and apply three coats of first grade Emulsion paint on Internal and external skirting	Internal and external skirting in cement mortar of 100mm high
_			S S	SM		MS	M	
Item	CM	lm			CM			Ξ
1.00	5.51	31.20	6.6	45.92	11.02	75.90	53.00	53.00
2,600,000	210,000	20,000	15,000	12000	35,000	4,500	4,500	5,500
2,600,000	1,156,680	624,000	99,000	551,040	385,560	341,550	238,500	291,500







TOTAL COST (VAT-INCLUSIVE)	ADD-VAT 18%	TOTAL COST (VAT-EXCLUSIVE)	ADD-CONTIGENCES 5%	TOTAL COST FOR COFFESHOP	S/Total	Floor Finishes with Cement and sand (1:3) screeds, of 50mm thick SM
						SM 55.08 15,000
14,098,142	2,150,564	11,947,578	568,932	11,378,646	7,114,030	0 826,200







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