

The Appraisal of the Nyakasura Cave and Waterfall Geosite—‘Amabeere ga Nyina Mwiru’, Toro—Fort Portal Scenic Area, Uganda

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Abstract: The Nyakasura caves and waterfall geosite of stalagmites and stalactites (191,271 m E, 74,776 m N) locally referred to as ‘Amabeere ga Nyina Mwiru’ is part of the Nyakasura—Fort Portal volcanic field and scenic area. The geosite is one of the country’s most exciting and educative features. This geosite has been long known and several legends about it were written and taught in schools. The site is taken care of by a family of the Rubomboras in whose home is situated and also referred to as the Wonder of Uganda and named Camp Beseri. The other beautiful sites include the landscape, panorama, the calderas, lava domes, water bearing and dry craters, fauna and flora and others viewed from the Kyeganywa hill (192391, 75681; 1,594 m, 00°41’2.0682” N, 30°14’11.3244” E) in Kabarole district. The nation’s capacity to strengthen geopark development lies in funding the development activities and inviting or attracting geopark expatriates as well as investors. The geopark development is fundamental for harnessing geotourism which is one of the opportunities Uganda has for achieving faster socio-economic transformation as per Uganda’s Vision 2040.

Key words: Geosite, geopark, sustainable development, geotourism, geoconservation and geoeducation.

1. Introduction

Uganda is one of the five East African Community countries. The country occupies an area of 241,000 km² and lies in the heart of the African plateau within the African plate, a continental crust containing Archean Cratons and crossed by the equator. She has a tropical-equatorial climate in addition to a variety of landscapes and other physical features (Figs. 1a and 1b), unique flora and fauna with a breath-taking beauty which gives her another name ‘The Pearl of Africa’. The income per capita is 1,300\$ per annum. Uganda is endowed with impressive geological sites that are potential pro-development occurrences.

As part of the general effort to document geosites in Africa, the OAGSs (Organization of African Geological

Surveys) invited the GSU (Geological Survey of Uganda) to submit information on the subject. In due course of assignment, there was increased awareness of the importance of geosites and the related concept of ‘Geopark’. The Survey is currently working towards having the Nyakasura cave and waterfalls geosite pioneer in the nation’s geosite recognition. The geosite comprising a cave, stalagmites and stalactites is the only one of its kind in Uganda with aesthetic, scientific, cultural and other unique values. It is a natural occurrence in the volcanic hills of Toro, famous for its legendary and cultural importance. The Directorate of Geological Survey and Mines, therefore, supported the appraisal and pledge to facilitate the activities towards the enhancement of its geographical and geological character. The eventual recognition of this geosite will create public awareness of its pro development potential through the promotion of geotourism. The concepts ‘geosites’, ‘geopark’, ‘geotourism’ and

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Fig. 1a Caldera, lava dam lake, landscape and flora.



Fig. 1b Signage to echo camp.

‘geoheritage’ are new, interesting and important in geoscience and have fast developing frameworks [1-12]. Brilha, J. [2] defines a geosite as an occurrence of one or more elements of geodiversity outcropping from the action of natural processes or due to human

intervention, well geographically delimited and with exceptional scientific value. Other values may also be present. Ehsan, S., et al. [8] denotes geotourism as utilization of geological heritage resources for education-based tourism-geoeducation; the site

provides a formal and informal education facility, geoconservation; protecting geosites and current geoheritage is passed on to future generations as a potential Palaeo environmental record preserved in landforms and sediments. The Nyakasura caves and waterfalls occurrence are a potential geotourism product that already protects geoheritage, sustains communities, communicates and promotes geological heritage and works with a wide range of different people. The official recognition of this geosite will promote awareness and further the understanding of the public authorities, private interests, local community and the other stake holders of the geological resource potential and its contribution to sustainable development. The Nyakasura caves geosite also known as Amabeere (breasts) caves geosite is located 8 km west of Fort Portal town off Bundibugyo road in a lovely hilly area and dotted with crater lakes. It is a limestone lain area and cave having stalagmites and stalactites. The geosite is a key feature of the proposed Western Region Geopark. The locally available information [9-12] on Uganda geosites and Uganda geoparks development which started in 2009 is found

in the unpublished reports with documentation on potential geosites some of which belong to the proposed Western Region Geopark of Uganda.

A geopark approach is an appropriate sustainable development strategy that can be integrated with the other development strategies. It will be a remedy if adopted to many of the African problems of poverty, hunger, economy and development to match the Uganda Vision 2040 “*A transformed Uganda society from a peasant to a modern and prosperous country within 30 years*” [13].

2. Nyakasura Geosite Position, Location and Access

The Nyakasura geosite in Kabarole district (Fig. 1c) is 256 km from Kampala following the Kampala-Fort Portal tarmac road. There are two tarmac roads that connect from Fort Portal town to Bundibugyo (56 km) and Kasese (68 km). The geosite is located 8 km west of Fort Portal and off Bundibugyo road, branching at the Nyakasura secondary school. The site has a cave and the waterfall is seen flowing through the roof of the cave.

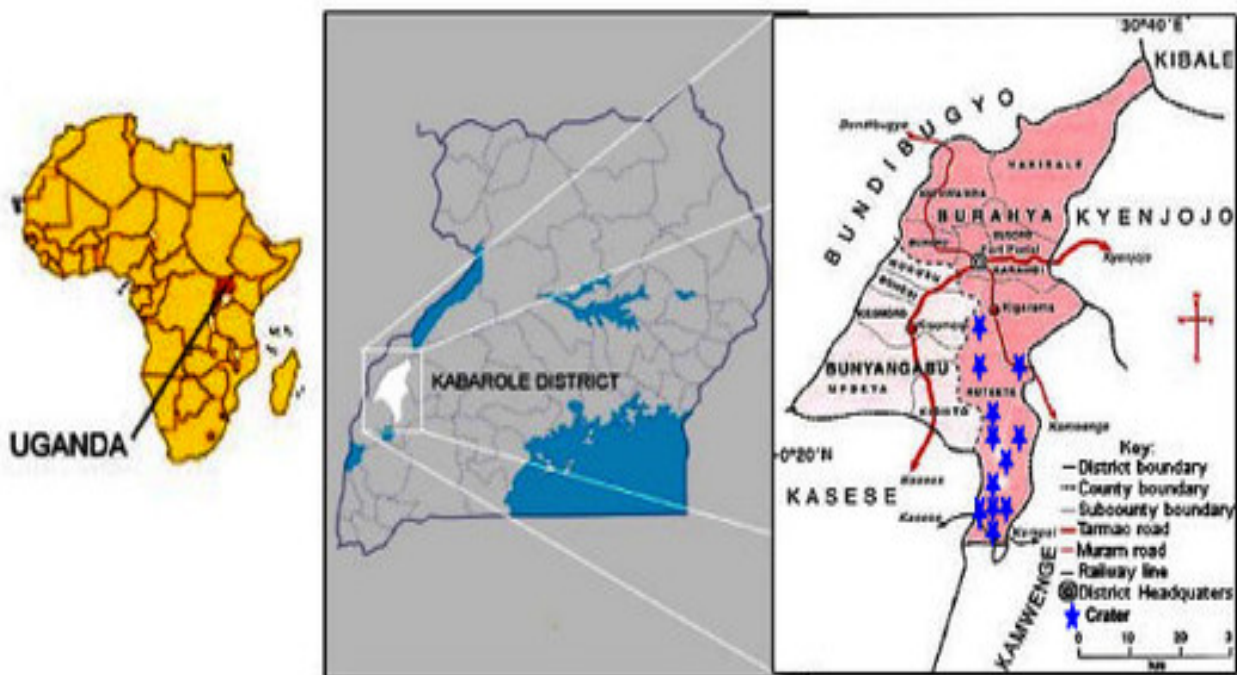


Fig. 1c Geosite positioning (Africa-East Africa-Uganda-Western Uganda).

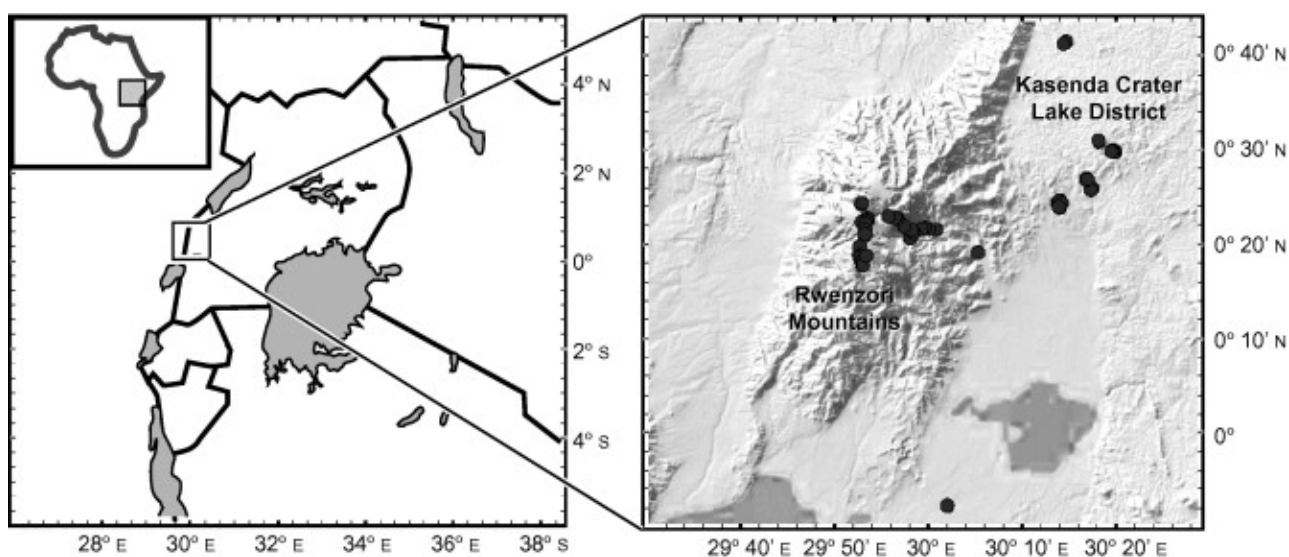


Fig. 2 Volcanic field image and its geographical position.

Fort Portal town is in both regional and strategic town categories of the Uganda vision 2040 development plan. The town is geographically located by the Rwenzori mountain ranges (Fig. 2) which influences the cool nature and climate. It is close to the boarder shared with D.R. Congo. Fort Portal is ranked amongst the clean towns and has the whole range of the star hotels for accommodation. The population in the area by 2010 was estimated 452,100. The main ethnic groups are the Batoro, Batuku and Basongora and also the Bakiga, Bakonjo and Bamba. The proposed geopark is located on the Fort Portal topo degree sheet 65, a volcanic field covering the districts of Kabarore, Kasese and Bundibugyo. Fort Portal town is the major town and there are twelve other trading centers for communities within the project area. As many as 49 crater lakes and other significant geopark features exist in the Ndale area.

3. The Nyakasura Current Status, Activity, Development, Appraisal and Legend

One is guided to this site by a sign post to a reception area (Fig. 3a) at a well-established artist fabrication also very close to a permanent well looked after homestead of the Rubomboras. The maintenance and salaries for the tour guides were provided by the

entrance fee of 6,000 UGX (\$2) per head. There is always great feeling; a refreshing and the ‘no stress’ experience at the Nyakasura geosite. The geosite receives visitors through the year while November and December are as the peak season. There are organized school geography trips in which pupils visit the cave and do the hills climbing and site seeing, community interaction among others. Figs. 3a, 3b and 4 provide the general impression of the touristic resource, activities while at the highlights of one of the visits to the geosite by the appraisal team in 2016. The visitors include students, geotourists and others both local and foreign, groups and individuals on holiday, researchers from universities and geologists. Originally, this was a ‘no-go’ area as it is believed to be the home of the historical Chwezi kingdom. Mr. Rubombora is remembered for having braved and occupied the place and he attached value to all superstitions. The educator OB (Old Budonian) King’s College Budo, Uganda and family of Batoro tribe own the land and locally do the protection by fencing the site. The Nyakasura falls and cave geosite occupies 910 acres, a private property for the Rubomboras also named Camp Beseri—Wonderland of Uganda. The family is the current management team who provide the protection status by fencing off the land with the caves. The sign



Fig. 3a Campsite reception.



Fig. 3b The Nyakasura geological touristic resources.

posts direct the visitors to the camp site and they have a reception place and tour guides. New tracks for climbing the hills, accessing the crater lakes and viewing the calderas were constructed.

The Nyakasura cave and falls geosite is included in the school geography and history syllabi taught as a physical feature of western Uganda and as a legend respectively. The legend is very interesting and has been taught in primary schools for 120 years. The cave ‘Amabeere ga nyina Mwiru’ (breasts of Mwiru’s mother) is named after Nyinamwiru who was the daughter of

Bukuku the gate keeper during the Batembuzi dynasty—predecessors of the current Babito Kings of Toro and Bunyoro kingdom. She was a beautiful girl who refused to marry the man her father chose for her. As a result, she was punished by cutting off her breasts, which then grew into rock dripping with milk. He eventually hid her away in the caves. Whilst there, Nyinamwiru was impregnated by the Batembuzi King Isaza to give birth to Ndahura, the future founder of the Bachezi dynasty. Because she had no breasts, she fed the infant with the cloudy limestone ‘milk’ that

drips from the breast-like stalactites. Legend has it that after, Ndahura surrendered the Bachwezi throne to his son and retired to his birthplace. Foot prints can still be reportedly be seen in the cave’s vicinity. Several other legends are told about the cave. One chamber is said to have been the resting place of the Bachwezi dogs, and the ceiling shows pits resembling dog paws (Fig. 5a). The dripping water from the woman breast

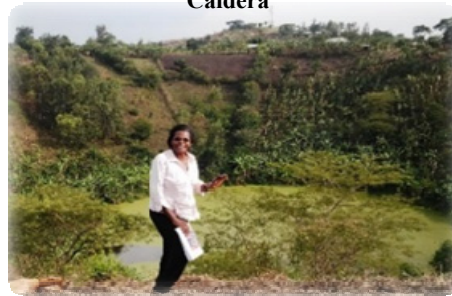
shaped stalactites (Fig. 5b) deposited white calcite, so the water looks whitish. This is why the local community calls it *breast milk*.

However, the guides are well educated and tell the scientific background as well as the legend.

A waterfall called Natural Shower (Fig. 5c) is said to have been used by the Bachwezi to take showers. The visitors are also allowed to do so if they wish.



Caldera



The team with Jajja Rubomboras (RIP, 2017)

Fig. 4 Appraisal visit team, 2016.



Fig. 5a Dog paws.



Fig. 5b Dripping breasts.



Fig. 5c The waterfall.



Fig. 6a Inside the cave.



Fig. 6b Visitor boot.

The Nyakasura appraisal exercise objective is to highlight the existence of the unique heritage and promotes awareness of its embedded potential as a development strategy and also to identify the problems and challenges at the site and to package for investors and seek for expert help and guidance on geosite enhancement and development. The inventorying activity of the geosites is a continuous exercise with GIS-aided data collection intended to track geotrails and route that goes through the proposed geopark. The tour involves a 3-hour walk with tour guides inside the caves (Fig. 6a) and later the other elements outside the caves which include climbing to the highest hill top and trailing the crater lakes, calderas and domes, beautiful little hills that allows one to appreciate the stress killing panorama. The caves and falls

management reports a growing visitor record for the last forty years. However, the cave requires quick protection intervention from the many threats—effects of frequent earth tremors, heavy rains, heavy vegetation-eucalyptus trees on the roof of the cave and visitor walking on the growing stalagmite (Fig. 6b).

5. The Proposed Geopark Route

The geopark tour may be started with Nyakasura geosite as ‘gateway’ or entry point. The draft map (Fig. 7) shows one possibility of a geopark area and the GPS track record of possible route from Nyakasura—Fort Portal taking Kamwenge road through Ndale crater lakes villages. The corresponding readings of coordinates for the stops or visited sites in the geopark are listed in Table 1. The panorama, relaxing ambience,

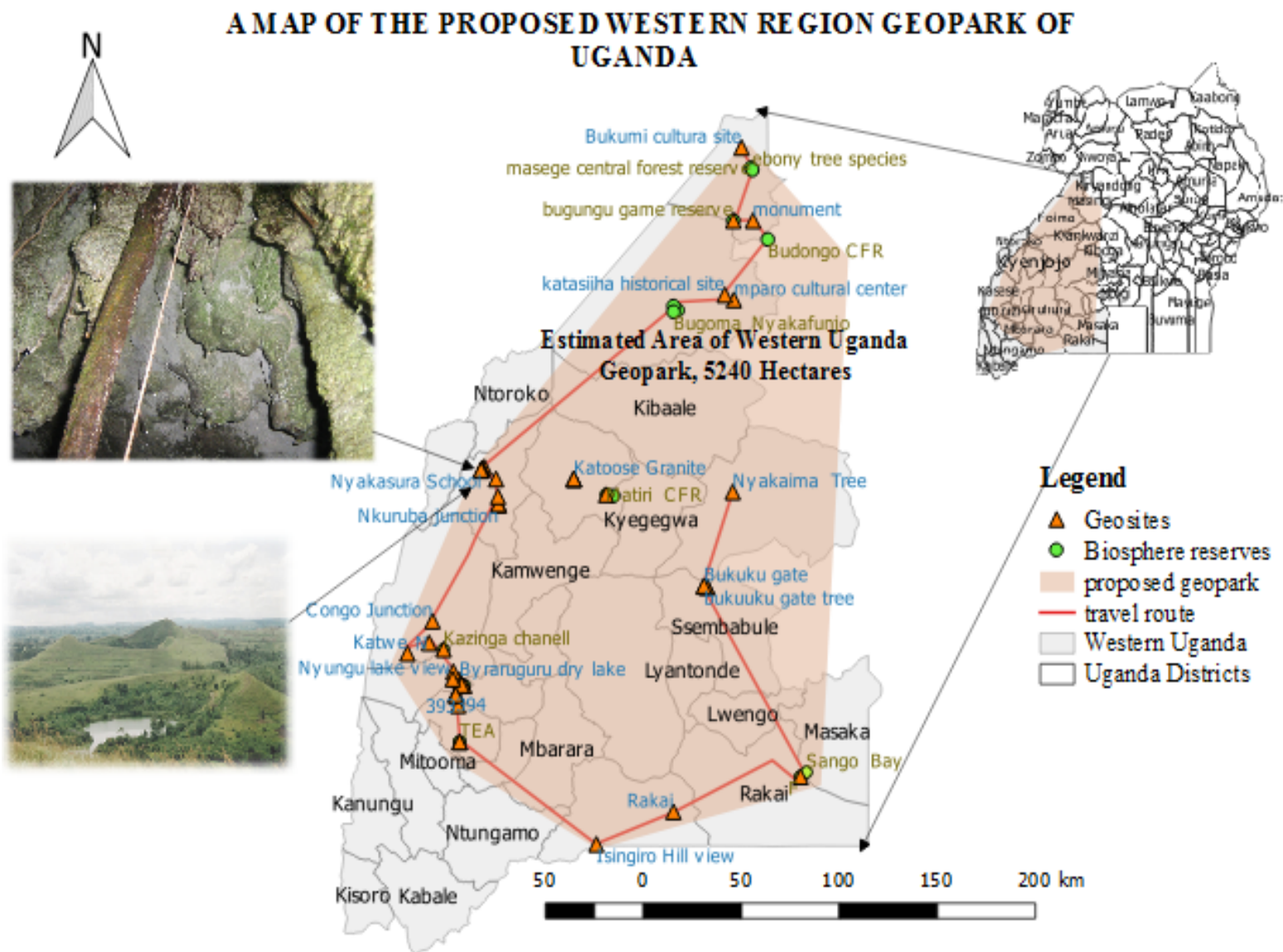


Fig. 7 Draft map showing extent and route of geopark.

Table 1 Coordinates of the visited sites in the geopark (biosphere and geosites).

| Site description | Description | Easting x | Northing y | Elevation (m) | Latitude x | Longitude y | District |
|-----------------------------------|-----------------|-----------|------------|---------------|------------------|------------------|------------|
| Katoosa central point | | 238,201 | 69,944 | 1,373 | 00°37'56.1659" N | 30°38'52.0854" E | Kyenjojo |
| Mabeere ga Nyina Mwiru | Point 1 meeting | 191,211 | 75,052 | 1,571 | 00°40'41.5835" N | 30°13'33.2026" E | Kabarole |
| | lake view point | 191,931 | 75,193 | 1,591 | 00°40'46.1839" N | 30°13'56.4678" E | Kabarole |
| Kyeganwa foot hills | | 192,391 | 75,681 | 1,594 | 00°41'2.0682" N | 30°14'11.3244" E | Kabarole |
| Nyakasura school | | 190,722 | 74,356 | 1,565 | 00°40'18.9323" N | 30°13'17.4127" E | Kabarole |
| Lake Nkuruma | junction | 199,581 | 57,468 | 1,505 | 00°31'9.6611" N | 30°18'3.9791" E | Kabarole |
| Lake Nkuruma camp site | | 199,603 | 57,668 | 1,493 | 00°31'16.1682" N | 30°18'4.6874" E | Kabarole |
| L Katwe Tc | | 821,017 | 9,984,098 | 913 | 00°8'37.2731" S | 29°53'1.2528" E | Kasese |
| Lake Katwe st | | 819,856 | 9,985,848 | 887 | 00°7'40.3519" S | 29°52'23.7327" E | Kasese |
| Kalinzu forest reserve | stop 1 | 179,800 | 9,940,572 | 1,616 | 00°32'13.1339" S | 30°7'24.7257" E | Rubirizi |
| | meeting pt | 179,029 | 9,958,488 | 1,504 | 00°22'30.3362" S | 30°7'0.0448" E | Rubirizi |
| Bunyaruguru dry wells | | 179,721 | 9,970,864 | 1,316 | 00°15'47.7648" S | 30°7'22.5166" E | Rubirizi |
| Kashoha forest reserve | | 182,155 | 9,968,232 | 1,281 | 00°17'13.401" S | 30°8'41.1433" E | Bushenyi |
| Nsongezi | | 249,746 | 9,890,266 | 1,232 | 00°59'31.2986" S | 30°45'4.596" E | Ishingiro |
| Sango bay | | 340,567 | 9,931,814 | 1,204 | 00°37'0.1407" S | 31°34'2.2215" E | Rakai |
| Bigo bya Mugenyi shrine | | 306,255 | 16,963 | 1,227 | 00°9'12.2338" N | 31°15'32.854" E | Ssembabule |
| Bukuuku gate tree | | 304,681 | 17,343 | 1,104 | 00°9'24.6005" N | 31°14'41.9542" E | Ssembabule |
| Nyakaima tree | | 319,456 | 63,433 | 1,572 | 00°34'25.1993" N | 31°22'39.4828" E | Mubende |
| Budongo CFR | | 337,380 | 187,832 | 3,587 | 01°41'55.7286" N | 31°32'17.1464" E | Masindi |
| Bbugungu game reserve | | 319,763 | 197,105 | 807 | 01°46'57.1714" N | 31°22'46.8972" E | Buliiasa |
| Bukumii Geosite extrctn of Marram | | 323,988 | 233,004 | 613 | 02°6'26.0708" N | 31°25'2.5085" E | Buliiasa |
| Masege central forest reserve | | 328,834 | 223,013 | 638 | 02°1'0.9411" N | 31°27'39.647" E | Buliiasa |
| Marram etraction site 2 | | 320,422 | 198,156 | 724 | 01°47'31.4077" N | 31°23'8.1892" E | Buliiasa |
| Ebony tree species | | 329,475 | 221,957 | 625 | 02°0'26.5794" N | 31°28'0.4222" E | Buliiasa |

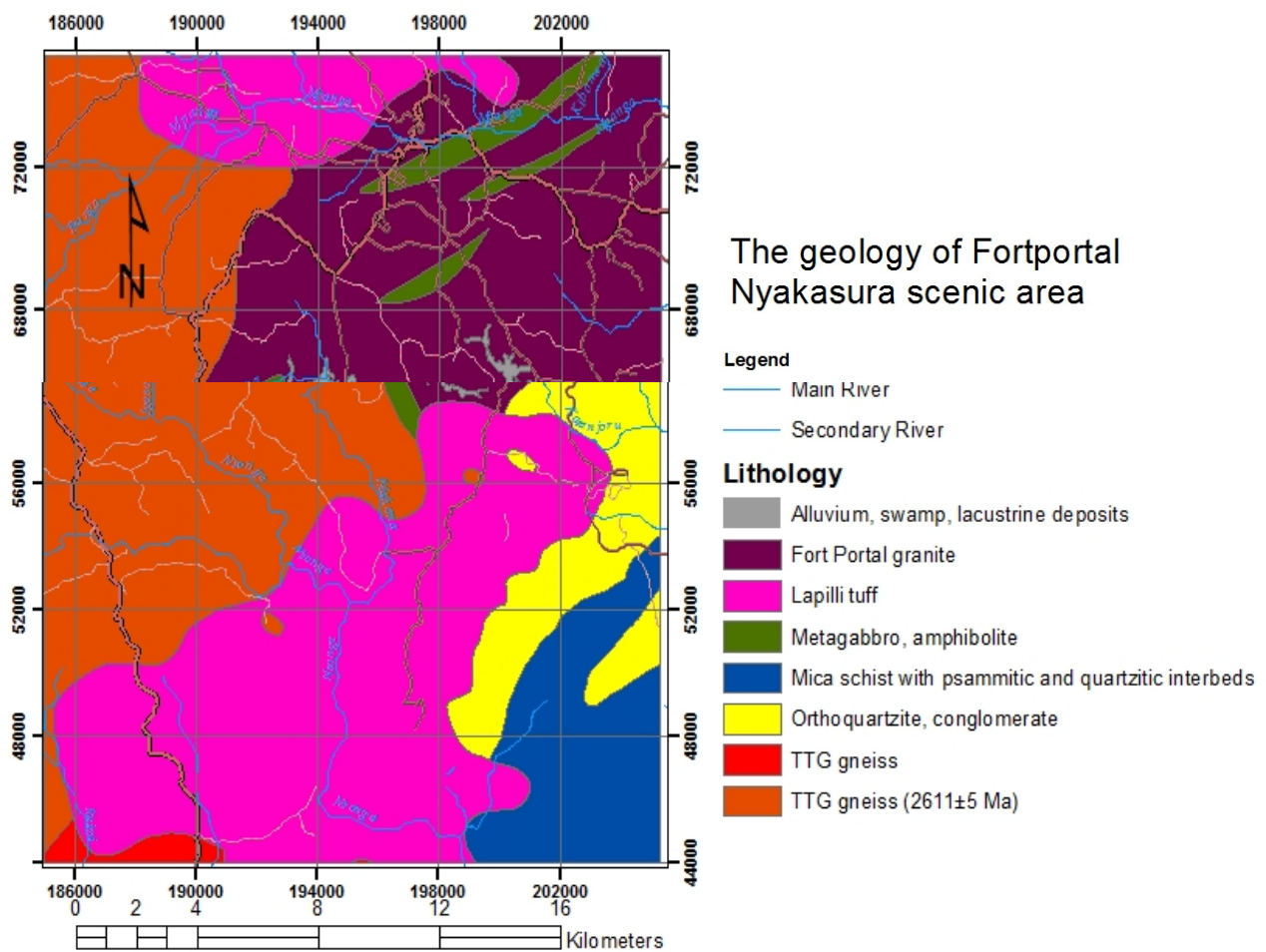


Fig. 8 The geology of the Nyakasura geosite area.



Fig. 9 Lapilli tuffs.

the banana plantations, the people and culture among others are the attractions on route. The other attractions included biotic, archeological and cultural sites biosphere reserves, the Queen Elizabeth National

Park, salt production project at Katwe, lime and cement production at Hima, the west arm of the East African rift valley and others. The available hotels, motels and lodging range in stars to five star hotels.

6. The Area Geology

The area geology (Fig. 8) is dominated by volcanic Lapilli tuffs (Fig. 9) which are pale grey in colour. They occupy the hills and form the rich black soils that favour agriculture. The tuff layers range from a few centimetres close to a metre. The tuffs surround the beautiful crater lakes. The crater lakes region is underlain with the Lapilli tuffs. They are raw materials for making building blocks for many houses including those of the Rubomboras—Caves Campsite.

7. Way Forward

The Geological Surveys Department, Ministry of Energy should continue with community awareness programs on what geosites and geoparks are and their importance. The Ministry continues to receive proposals and facilitation of the geosite development activities and is financially supported. The activities include the inventorying, GPS aided tracking and making geopark map. The Ministry’s main function is to create an enabling environment in order to attract investment in the development of the resource. There is need to search for and develop partnerships with investors and geosite-geopark experts. They will together supplement the technical gaps, guide on the work plan and budget for the development of the geopark and mobilize the participation of public authorities, private interests and local communities.

8. Conclusion and Recommendations

There is hope for the area developing as a result of the existence of Nyakasura geosite. The Geological Survey and Mines Department has so far contributed to the collection of geosites and a list of the geosites that exists in the country has been generated. The potential of the geosite is evident. The community begins to appreciate the importance of the geosite and would benefit from its development. Many visitors appreciate the stress-killer environment as well as learning and leisure. Training and exposure of the geosites team through refresher courses, conferences

and seminars by geosite-geopark investors and experts in order to equip the members with the knowledge and skills to speed up the promotion and development of these sites. The Directorate of Geology will have contributed towards the economic growth of this country as per its mandate.

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