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Research Article

THE CONTRIBUTION OF BIODIVERSITY TO TOURISM DEVELOPMENT IN RWANDA, A CASE STUDY OF AKAGERA NATIONAL PARK

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ABSTRACT

This study assessed the contribution of biodiversity to tourism development in Rwanda, with a reference to Akagera National Park. The results indicated that as tourist attractions, biodiversity resources accommodated by Akagera National Park, which includes the big five game animals namely, buffaloes, lions, rhinoceroses, elephants, and leopards contribute significantly to the development of tourism in that national park. Rwanda Development Board (RDB) and Akagera Management Company (AMC) use the money earned from tourism in the management of that park. The results further revealed that the major threats to biodiversity in Akagera National Park include climate change, human-wildlife conflicts, and human's illegal activities. The respondents illustrated that the biodiversity conservation strategies used in that park include: Electric-fencing, revenue sharing program, Special Guarantee Fund compensating victims of wild animals' damages, and the agreement for the park management signed between RDB and African Parks. They further demonstrated how both tourism and biodiversity complement each other where, tourists visit the park mostly because of the various biodiversity resources it accommodates. In addition to the strategies used by the Rwandan government to deal with biodiversity threats in all protected areas in the country, REMA, RDB, MINICOM, PSF, MINEDUC, Financial institutions like banks and other microfinances were recommended to work together by encouraging both domestic and foreign entrepreneurs to invest in biodiversity conservation projects and reward the best performers. Furthermore, they were suggested to educate citizens about Rwanda biodiversity conservation policy. Finally, more scientific researches on various biodiversity species to be introduced in different protected areas such as elephants in Nyungwe National Park were also recommended.

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INTRODUCTION

The tourism industry represents one of the main sectors in the global economy, often referred to as the world's largest single industry (Huang, Zhou, & Ali, 2011). Many countries including Rwanda have invested more in the development of sustainable tourism as a source of various categories of employment opportunities. Within this period of after industrial revolution, which is considered as a starting point of modern tourism, tourism has been identified by many countries as one of the world's fastest growing sectors (Hashimoto & Telfer, 2017). In 2017, about 119 million people worldwide were directly working in tourism industry and the number increased to 296 million employees in 2019 (Bianchi & de Man, 2021). The

number of international tourists has increased from 25 million in 1950 to over 1.3 billion in 2017 and tourism industry is expected to grow to 3.3 % annually until 2030 (Pham *et al.*, 2019). Over the last decade, nature and adventure travel has emerged as one of the fastest-growing segments of the industry (Hansen, Mladenović, Brimberg, & Pérez, 2019). Much of this growth has taken place in biodiversity hotspots, areas sheltering many species unique to that region, where tourism represents both opportunities for and threats to biodiversity conservation (Ballantyne & Pickering, 2013). In the United Kingdom (UK), the remarkable beauty of the Lake District, dramatic cliffs of the North Devon Coast, rugged Welsh hills, and the wilderness of Scotland provide a diversity of landscapes and biodiversity (Hall, 2010). Additionally,

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gardens, parks, and historical sites in villages, towns and cities harbor biodiversity, forming part of the natural heritage of the UK (Coombes & Jones, 2010).

In 1992, the United Nations adopted the text of the Convention on Biological Diversity (CBD) at a conference held in Nairobi, Kenya. From 2001 onwards, each year on May 22, the International Day for Biological Diversity (IBD) has been observed as a celebration of this achievement. One of the main objectives behind celebrating IBD is to foster understanding and raise awareness about the importance, concerns and challenges about biodiversity (Ramírez & Santana, 2019). Biological resources have become a valuable asset to sustain the tourism sector (Dube & Nhamo, 2020). Recognizing the important interconnection between tourism and biodiversity, the United Nations World Tourism Organization (UNWTO) promotes sustainable, responsible, and universally accessible tourism. Sustainable tourism harmonizes and sets a perfect balance between environmental, economic, and socio-cultural aspects (Adebayo, 2019).

In Rwanda, sustainable tourism has been identified to be a major source of revenue and employment for local communities, providing them with a strong incentive to protect biodiversity (Poyyamoli, 2019). At present, mountain gorilla is no longer a single key tourism product to rely on, but others including the big five game animals and other biodiversity resources including plants, and aquatic animals available in Akagera National Park or in other protected areas attract a big number of visitors who spend a lot of money that contributes to the economic development of the country (Nielsen & Spenceley, 2011). In reality, tourism is both an opportunity for conserving nature and a threat to nature, if not conducted responsibly (Lee & Jan, 2019). Therefore, while the main purpose of the Rwandan government is to develop sustainable tourism, this paper aimed at evaluating how biodiversity contributes to the achievement of such purpose by focusing on tourism and biodiversity in Akagera National Park.

MATERIALS AND METHODS

Study area description

Akagera National Park where the research was conducted is one of the four national parks found in Rwanda: Akagera, Nyungwe, Volcanoes and Gishwati-Mukura National Parks. It is located in North Eastern part of Rwanda, at the country's border with Tanzania. The park is dominated by swamps and small lakes with flow in the wake of River Akagera and it was obviously named after this river which feeds different water bodies including Lake Ihema. All the water sources work together to create a piece of spectacular scenery. The landscape is low, composed of wide plains dominated by grass, cactus-like *Euphorbia candelabra* shrub and both thick and thin forests although it does carry on with the general rugged terrain that is so characteristic of Rwanda (Nsabimana & Spencer, 2015). Historically, Akagera National Park was founded in 1934 by the Belgian colonial government to protect animals and vegetation, and it is the largest protected wetland in Africa. The park used to cover over 2,500 sq km but in 1997, it was reduced in size by close to 50% (1,122 sq km) where, a lot of land was reallocated to refugees returning to Rwanda after the civil strife of the genocide (Kanyamibwa, 1998).

Before 1997, many refugees returning to Rwanda had settled in the area and the conservation was harmed by poaching and cultivation. It is in this situation that both lions and rhinoceroses became extinct from the park except that they were reintroduced to complete the big five game animals (lions, rhinoceroses, buffaloes, elephants, and leopards) in the park since 2015. Since 2009, the park is managed by Rwanda Development (RDB) in partnership with African Parks which has established Akagera Management Company (AMC) whose responsibility is to day to day manage the park (Lindsey et al., 2017).

Akagera National Park experiences only two types of weather which include the sunny and rainy weather. The former usually manifests the dry season in the park while the latter shows that the park is experiencing its wet season. Temperatures range between 20 and 30 degrees Celsius. The months of December-February are short dry season, March to May mark the long rainy season, long dry season occurs between June and September while, from October till November characterize the short wet season in the park (Ndayisaba et al., 2017). The park is surrounded by three Districts namely: Kayonza (populated by 344,157 inhabitants), Gatsibo (populated by 433,020 inhabitants) and Nyagatare District with a total population of 466,944 inhabitants according to the 2012 National Census.



Google map of Akagera National Park

Sample and data collection techniques

Based on the fact that the study population was 55 individuals composed of 5 staff from Rwanda Development Board (RDB), 47 staff from Akagera Management Company (AMC) and other 3 community leaders, and also that according to Suresh & Chandrashekar's (2012), it is better to consider all members of the study population as the respondents and to survey all of them to get meaningful data if their number is less than 100 individuals, all these 55 people were considered as the respondents in this study (there was no need for sample size selection).

Table 1 Sample size

Population categories	Population size	Sample size
RDB/Tourism and Conservation	5	5
Department staff	3	3
Park managers	4	4
Front office staff	22	22
Park guides	18	18
Park rangers	3	3
Community leaders		
Total	55	55

Group discussion, participant observation, face to face interview and self-administered questionnaires were used as techniques to collect both qualitative and quantitative data about the contribution of biodiversity to the development of tourism in Akagera National Park. Descriptive research design was also applied and the collected data were treated statistically with the aid of Statistical Package for Social Sciences (SPSS) Version 21.

RESULTS AND DISCUSSIONS

Contribution of biodiversity to tourism development

Based on the research findings, biodiversity is a big contributor to the development of tourism not only in Rwanda but also in other countries where, coasts, mountains, rivers, forests and animals are the major tourist attractions around the world (Irawan, 2015). All forms of tourism even in city centers rely on natural resources for supplies of food, clean water and other ecosystem services that ultimately depend on biodiversity (Cetin & Sevik, 2016). Furthermore, biodiversity contributes significantly to the attractiveness and quality of destinations, and therefore to their competitiveness: for example, coastal water quality and natural vegetation are both ecosystem services that contribute to destination attractiveness. And biodiversity is a direct attraction at the heart of nature-based tourism products such as wildlife watching, scuba diving or tourism in protected areas (Mertz *et al.*, 2018).

Table 2 Contribution of biodiversity to tourism development in Akagera National Park

Contribution	Frequency	Percentage %
Biodiversity resources such as wild animals that serve as the most visited tourist attractions in the park	14	25.5
The money paid by tourists who visit biodiversity resources promotes park management	11	20
Infrastructure development in the park	10	18
Marketing of the park	8	14.5
Biodiversity brings foreign exchanges and incomes	12	22
Total	55	100

The Table 2, illustrates the contribution of biodiversity to tourism development in Akagera National Park. The results clarified that many of the attractions mostly visited by tourists in the park are biodiversity resources including wild animal species like buffaloes, elephants, lions, zebras, giraffes, antelopes, impalas, leopards and rhinoceros. Therefore, the money paid by tourists who visit such biodiversity resources is used in park management. The results further illustrated that these resources contribute more to infrastructure development needed by the park’s visitors, and also in marketing of the park. As it is known, Akagera National Park is comprised of savannah, swamps, lakes, woodland and open grassland

habitats which host about 80% of the wild animal species in Rwanda. The park has many lakes including lake Ihema where tourists are likely to catch sight of numerous hippos and the thrilling outsized Nile Crocodiles and also to observe some water-birds.

Tourists also do fishing as sport activity at lake Shakani. From 2015, Akagera National Park is known as the only one park in Rwanda to accommodate the Big Five animal species namely: lion, elephant, black rhinoceros, leopard, and African buffalo. Other attracting animals include Massai Giraffes, zebras, hyenas, and more than a dozen types of antelopes, more than 525 bird species including papyrus gonolek, African Wattled Plover, Giant Kingfisher, Senegal Lapwings, Squacco Herons, African Open bill stock, Grey Crowned Crane, African Darter, Long-toed, Water Thick-knee and bizarre shoebill stork (the most eagerly sought of all African birds) that attract a big number of tourists the way that according RDB’s report, Akagera National Park was recorded as the first national park to be visited in Rwanda in 2018, where it was visited by 51, 711 tourists; an increase of 17 % comparing to the statistics of the year 2017 (activities performed by tourists include; game drives, bird watching, boat safari on lake Ihema, Sport fishing on lake Shakani, and Cultural tours near the park).

In the same year 2018, Nyungwe National Park was recorded the second to be visited with the total number of 15,665 visitors; an increase of 9% comparing to the statistics of the year 2017. For the Volcanoes National Park, the total number of visitors in 2018 was 15,132 who spent \$19,000,000; an increase of 25% comparing to the statistics of the year 2017. In general, the total amount of money collected by RDB from tourism activities performed in the three national parks increased from \$18 million in 2018 to \$ 20 million in 2019 (Odunga *et al.*,2020). Through sustainable conservation of wildlife and effective use of tourism marketing strategies, RDB targets to increase tourism revenues from \$438 million generated in 2017 to \$800 million by 2024 (Price, 2018). This will be achieved through better management of the parks’ resources including biodiversity. Price, R. (2018).

Major threats to biodiversity

Biodiversity is under serious threat as a result of human activities. Researches such as Donatti, Harvey *et al.*, (2020), clarified that the main dangers worldwide are population growth and resource consumption, climate change and global warming, habitat conversion and urbanization, invasive alien species, over-exploitation of natural resources and environmental degradation. As far as Akagera National Park’s biodiversity is concerned, the major threats according to the research findings are illustrated in Table 3 where, Climate was highlighted as one of these threats. Normally, the climate in the Eastern Province is more humid and warmer than the rest of Rwanda and as a result, it features fertile agricultural lands and excellent grazing.

Table 3 The major threats to biodiversity in Akagera National Park

The major threats are:	Frequency	Percentage%
Climate change	14	25.5
Illegal human’s activities	16	29
Increase in tourists disturbs animal behaviors	12	22
Human-wildlife conflicts	13	23.5
Total	55	100

However, the situation becomes worse mostly due to human activities which result in climate change. For example, the previous drought in the Eastern Province had some negative impacts on ecosystems where about 1,750 cows in Nyagatare District died in 2015 due to lack of fodder and water. This situation has also affected biodiversity in Akagera National Park where, animals lived difficultly due to the effects of drought in the area.

The respondents further emphasized on illegal human activities such as poaching, illegal mining, bushfires, boundary encroachment, tree cutting and vegetation clearing, wild animal poisoning (lions which used to go out from the park and kill local communities' cows, became extinct due to the poison called "Kalo"), illegal fishing, agricultural intensification, and illegal grazing as the serious threats to biodiversity in Akagera National Park.

Other major threats are the increase in tourists' number which disturbs animal behaviors, and human-wildlife conflicts. As a matter of fact, the problems such as deforestation was not possible in the mid 1990 because under the 1993 Arusha Accord, it was resolved that returning Rwandan refugees would be settled into open unsettled areas the areas deemed most suitable were the Akagera National Park and the Mutara Hunting Reserve and for this reason, all hunting reserve places were completely removed and the park was reduced by two-thirds. Additionally, Rwandan citizens who use to migrate from their mother provinces especially from Northern and Western Provinces to Eastern Province being attracted by availability of lands has resulted in the high population growth in that province and their activities have caused the severe loss of biodiversity, ecosystems, and the further decline of flora and fauna species as well. The problem of biodiversity decline also appears in other countries like Belgian where, the destruction and fragmentation of natural habitats, pollution and eutrophication are mostly caused by agricultural and industrial practices, excessive water catchments in some areas, climate change and perturbations linked to leisure and tourism (Weisse & Goldman, 2019). Therefore, basing on the role played by biodiversity in the life possibility on this earth, countries including Rwanda have undertaken conservation strategies to safeguard the remaining species so that they cannot become extinct from the world.

Biodiversity conservation strategies

Like other countries worldwide, Rwanda has undertaken some mitigation measures for threats to biodiversity (Venuste, Olivier, & Valens, 2017). These include promoting smart and green transportation to reduce the country's contribution to climate change, and improve the quality of air (Peprah, Amponsah, & Oduro, 2019), prioritizing made in Rwanda initiative where, since many of the products consumed in Rwanda are brought to the country by ship and truck, the government has prioritized this initiative to keep environment safe and also as one of the best strategies to deal with the problem of climate change (Hurley, Morris, & Portelance, 2019). Another strategy is planting more trees where, on the new land use masterplan 2020, forests should occupy 29.3% of the Rwanda's total surface (Hudani, 2020). Particularly, some biodiversity conservation strategies have been applied in Akagera National Park as it is illustrated by Table 4.

Table 4 The strategies used by the government for biodiversity conservation in ANP

The used strategies:	Frequency	Percentage %
Construction of an electric fence around the park	7	13
Engaging local people in the conservation of the park resources	11	20
Compensating victims of wild animals' damages through Special Guarantee Fund	9	16
Revenue Sharing Scheme	10	18
Allowing African Parks to manage Akagera National Park	6	11
Re-introduction of animals (lions and rhinoceroses)	12	22
Total	55	100

The strategies used by the Rwandan government for biodiversity conservation in Akagera National Park include an electric fence built by the park management in 2013 to reduce human-wildlife conflict in the area. The project was funded by RDB at the tune of over Rwf 2.7 billion, covering 110 kilometers, the fence has 1.8m highline of metallic pots with 8 horizontal electrified wires and it is expected to last 40 years and it is powered with solar energy a resource abundant in the area with power energizers. Another strategy is local community involvement in conservation of the conservation of the park resources where, some work as tour guides, park rangers, Irondo personnel, or also through community work locally known as Umuganda.

Respondents also highlighted Special Guarantee Fund which was put in place in 2011 to compensate victims of wild animals' damages in areas that are in close proximity with national parks. Furthermore, in 2005, Rwanda Development Board (RDB) has introduced Revenue Sharing Scheme where, local communities living near the parks get 10% of the parks' revenues as a motivation to participate in conservation of the parks' resources. With this program, different infrastructure such as roads, health centers, schools, water electricity supplies were built in that area. Revenue sharing program has also been applied with good results by many countries including Uganda where, local people living near parks are given 20% of the parks' revenues (Uwayo, Nsanzumukiza, Maniragaba, Nsabimana, & Akimanizanye, 2020), while in Malawi, the amount given is 25% (Machlis & Tichnell, 2019).

Respondents further clarified that there is a 20-year renewable agreement for the park management signed between RDB and African Parks in 2009 followed by formation of Akagera Management Company in 2010. Some important realizations from this joint management include reintroduction of locally extinct species where in July 2015, seven lions from South Africa (AndBeyond donated five lionesses from Phinda Private Game Reserve, and Tembe Elephant Park in KwaZulu-Natal donated two male lions). Since 2015, the population has grown to over 20 lions and it keeps growing. Between 2017 and 2019, RDB and African Parks reintroduced 25 Eastern black rhinoceroses from South Africa to complete "big five game animals". Security measures used in that park include: deploying an air surveillance helicopter, training of an expert rhino tracking and protection team and a canine anti-poaching unit. With these measures, the large mammal population has increased since 2010, from 4000 animals in 2010 to over 13.500 in 2018. This is a good achievement that shows the success of the government's measures for biodiversity

conservation in Akagera National Park which no doubt positively affects the development of tourism in that area.

Biodiversity conservation and tourism development

For the relationship between biodiversity and tourism development, researchers such as (Snyman & Spenceley, 2019), clarified that good biodiversity management is good business for tourism companies. They indicate that through contributing to the conservation of biodiversity, tourism companies can improve the quality of the service or product provided, enhance their reputation, increase recognition, publicize themselves, save on costs and increase their income. Table 5 illustrates the complementarity between tourism and biodiversity in Akagera National Park.

Table 5 Complementarity between tourism and biodiversity in Akagera National Park

Relationship	Frequency	Percentage%
Both tourism and biodiversity complement each other because the threats to one results in negative impacts on another and vice versa	26	47
Tourists visit Akagera National Park mostly because of availability of biodiversity resources such as animal and plant species	29	53
Total	55	100

Respondents revealed that in Akagera National Park like in other protected areas, both tourism and biodiversity complement each other because the threats to one results in negative impacts on another and vice versa. They further confirmed that tourists visit Akagera National Park mostly because of availability of biodiversity resources such as animal and plant species. However, researchers such as (Munslow, 2019), clarified that although tourism can be a mechanism to benefit biodiversity and the maintenance of natural capital, many of the factors linked to biodiversity loss such as land clearance, pollution and climate change also affect tourism development.

CONCLUSION

The aim of this study was to analyze the contribution of biodiversity to the development of tourism in Rwanda with Akagera National Park as a study area. The findings clearly shown that due to the fact that many of biodiversity resources including animals and plant species are tourist attractions, good management of biodiversity is very important to the development of tourism in Akagera National Park because the money spent by tourists is used in the park management for provision of better tourism services. The Rwandan government has already identified the major threats to biodiversity in Akagera National Park, the way that it has undertaken the strategies to overcome them where for example since 2009, Rwanda Development Board (RDB) works in partnership with African Parks in the management of the park and the results are highly promising. However, Akagera National Park is not the only one protected area in Rwanda where biodiversity resources attract tourists, but there are so many others including the three national parks namely; Nyungwe, Volcanoes, and Gishwati-Mukura National Parks where, other more researches on biodiversity and tourism development could be conducted, but due to time and financial constraints, the study was only limited to Akagera National Park. So, more research needs to

be conducted in these three remaining national parks, in order to get more additional data as a completion to this study.

Recommendations

As it was revealed by the research results that biodiversity resources play a big role in the development of tourism industry in Rwanda, but that these resources still face some threats in their natural habitats, even if the Rwandan government has undertaken strategies to deal with these threats, the concerned government institutions such as Rwanda Environmental Management Authority (REMA), Rwanda Development Authority (RDB), Ministry of Trade and Industry (MINICOM), Private Sector Federation (PSF), the Ministry of Education (MINEDUC), Financial institutions like banks and other microfinances were suggested to work together by encouraging both domestic and foreign entrepreneurs to invest in biodiversity conservation projects. To encourage investment competition, there should be some periodic evaluations about projects performance, where the best ones should be rewarded. To do it better, national annual biodiversity conservation festivals should be carefully organized.

The fact that human’s activities are some of the biggest threats to biodiversity resources either aquatic or terrestrial, RDB, REMA, MINEDUC, local leaders, and other concerned stakeholders should put more efforts in educating all citizens about Rwanda biodiversity policy. The easiest ways to do this include the use of media (radio, televisions, and newspapers), telephone SMSs, and open meeting. To develop the culture of biodiversity conservation in Rwandan youth, the Ministry of Education (MINEDUC) should elaborate a curriculum containing biodiversity related subject which should be taught in all levels of educations from primary to university.

Furthermore, as it was done for lions, rhinoceroses and grey crowned crane in Akagera National Park, more scientific researches should be done to know more about other different biodiversity species which can be introduced not only in Akagera National Park but also in other Rwanda’s protected areas to attract more tourists. For example, RDB should plan how to reintroduce elephants in Nyungwe National Park to increase tourism demand in that park.

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Disclosure statement

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References

Adebayo, O. (2019). Loss of biodiversity: the burgeoning threat to human health. *Annals of Ibadan postgraduate medicine*, 17(1), 5-7.
 Ballantyne, M., & Pickering, C. M. (2013). Tourism and recreation: a common threat to IUCN red-listed vascular plants in Europe. *Biodiversity and Conservation*, 22(13-14), 3027-3044.

- Bianchi, R. V., & de Man, F. (2021). Tourism, inclusive growth and decent work: A political economic critique. *Journal of Sustainable Tourism*, 29(2-3), 353-371.
- Cetin, M., & Sevik, H. (2016). Assessing potential areas of ecotourism through a case study in Ilgaz Mountain National Park. *Tourism-from empirical research towards practical application*, 81-110.
- Coombes, E. G., & Jones, A. P. (2010). Assessing the impact of climate change on visitor behaviour and habitat use at the coast: A UK case study. *Global environmental change*, 20(2), 303-313.
- Donatti, C. I., Harvey, C. A., Hole, D., Panfil, S. N., & Schurman, H. (2020). Indicators to measure the climate change adaptation outcomes of ecosystem-based adaptation. *Climatic Change*, 158(3), 413-433.
- Dube, K., & Nhamo, G. (2020). Sustainable development goals localization in the tourism sector: Lessons from Grootbos private nature reserve, South Africa. *GeoJournal*, 1-18.
- Hall, C. M. (2010). Tourism and biodiversity: more significant than climate change? *Journal of Heritage Tourism*, 5(4), 253-266.
- Hansen, P., Mladenović, N., Brimberg, J., & Pérez, J. A. M. (2019). Variable neighborhood search *Handbook of metaheuristics* (pp. 57-97): Springer.
- Hashimoto, A., & Telfer, D. J. (2017). Transformation of Gunkanjima (Battleship Island): from a coalmine island to a modern industrial heritage tourism site in Japan. *Journal of Heritage Tourism*, 12(2), 107-124.
- Huang, G., Zhou, W., & Ali, S. (2011). Spatial patterns and economic contributions of mining and tourism in biodiversity hotspots: A case study in China. *Ecological Economics*, 70(8), 1492-1498.
- Hudani, S.E. (2020). The Green Masterplan: Crisis, State Transition and Urban Transformation in Post-Genocide Rwanda. *International Journal of Urban and Regional Research*, 44(4), 673-690.
- Hurley, J., Morris, S., & Portelance, G. (2019). Examining the debt implications of the Belt and Road Initiative from a policy perspective. *Journal of Infrastructure, Policy and Development*, 3(1), 139-175.
- Irawan, H. (2015). Developing Scientific Interest to Marine Biodiversity as Part of Coastal Tourism and Conservation. In *1st International Conference On Maritime Development* (pp.1-5).
- Kanyamibwa, S. (1998). Impact of war on conservation: Rwandan environment and wildlife in agony. *Biodiversity & Conservation*, 7(11), 1399-1406.
- Lee, T. H., & Jan, F.-H. (2019). Can community-based tourism contribute to sustainable development? Evidence from residents' perceptions of the sustainability. *Tourism Management*, 70, 368-380.
- Lindsey, P.A., Petracca, L. S., Funston, P.J., Bauer, H., Dickman, A., Everatt, K., ... & Loveridge, A. (2017). The performance of African protected areas for lions and their prey. *Biological Conservation*, 209, 137-149.
- Machlis, G. E., & Tichnell, D. L. (2019). *The state of the world's parks: An international assessment for resource management, policy, and research*: Routledge.
- Mertz, O., Ravnborg, H. M., Lövei, G.L., Nielsen, I., & Konijnendik, C.C. (2007). Ecosystem services and biodiversity and Conservation, 16(10), 2729-2737.
- Munslow, B. (2019). *Guyana: microcosm of sustainable development challenges*: Routledge.
- Ndayisaba, F., Nahayo, L., Guo, H., Bao, A., Kayiranga, A., Karamage, F., & Nyesheja, E. M. (2017). Mapping and monitoring the Akagera Wetland in Rwanda. *Sustainability*, 9(2), 174.
- Nielsen, H., & Spenceley, A. (2011). The success of tourism in Rwanda: Gorillas and more. *Yes Africa Can: Success stories from a dynamic continent*, 231-249.
- Nsabimana, E., & Spencer, J.P. (2015). The need of a tourism management framework for the conservation of Rwanda's national parks. *EXTENDED ABSTRACT BOOK*, 49.
- Odunga, P.O., Manyara, G., & Yobesia, M. (2020). Estimating the direct contribution of tourism to Rwanda's economy: Tourism satellite account methodology. *Tourism and Hospitality Research*, 20(3), 259-271.
- Peprah, C., Amponsah, O., & Oduro, C. (2019). A system view of smart mobility and its implications for Ghanaian cities. *Sustainable Cities and Society*, 44, 739-747.
- Poyyamoli, G. (2019). Eco-cultural tourism for biodiversity conservation and sustainable development of remote ecosystems in the third world *Sustainable Tourism: Breakthroughs in Research and Practice* (pp. 144-166): IGI Global.
- Price, R (2018). The contribution of wildlife to the economics of Sub-Saharan Africa.
- Ramírez, F., & Santana, J. (2019). Environmental education and biodiversity conservation *Environmental Education and Ecotourism* (pp. 7-11): Springer.
- Snyman, S., & Spenceley, A. (2019). *Private sector tourism in conservation areas in Africa*: CABI.
- Uwayo, P., Nsanzumukiza, V. M., Maniragaba, A., Nsabimana, A. P., & Akimanizanye, V. (2020). Contribution of Former Poachers for Wildlife Conservation in Rwanda Volcanoes National Park. *Journal of Geoscience and Environment Protection*, 8(4), 47-56.
- Venuste, N., Olivier, H., & Valens, N. (2017). Knowledge, Attitudes and Awareness of Pre-Service Teachers on Biodiversity Conservation in Rwanda. *International Journal of Environmental and Science Education*, 12(4), 643-652.
- Weisse, M., & Goldman, E.D. (2019). The world lost a Belgium-sized area of primary rainforests last year. *World Resources Institute*, 29.

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