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Challenges of Geotourism in South Africa: A Case Study of the Kruger National Park

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Abstract: As a new phenomenon, geotourism research is on the rise. Although South Africa has some interesting geoheritage sites, not much has been done to investigate the potential contribution of geotourism to the tourism sector, the protection of natural resources and employment generation, let alone the challenges that may be experienced in promoting geotourism. Therefore, this paper aims to describe the concept of geotourism and to identify the challenges of geotourism. It achieves this by looking at the case of the Kruger National Park, one of the largest game reserves in Africa, containing an abundance of geotourism sites. This research adopted a qualitative approach, with data collection involving semi-structured interviews with sixteen key informants to understand the challenges of geotourism. Manual content analysis was employed for analysing the data. A significant finding was that there were seven potential challenges in promoting and developing geotourism in the Kruger National Park: (1) a lack of packaging and marketing; (2) a lack of infrastructure; (3) security and access to geoheritage sites by tourists; (4) access to finance and markets; (5) destruction of geoheritage sites; (6) social challenges and (7) regulatory challenges. The results indicated that these challenges of geotourism can lead to negative perceptions about geotourism and can negatively impact the potential for geotourism development towards effective local social sustainability, especially for communities abutting the KNP. The major contribution of this study is its expansion of the geotourism academic literature through newly generated data on the challenges of geotourism in South Africa. Furthermore, this study theoretically contributes to the body of knowledge on geotourism and its challenges in Africa, particularly regarding the Kruger National Park.

Keywords: geotourism; challenges; Kruger National Park; South Africa



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1. Introduction

The roots of geotourism in the tourism literature can be traced as far back as 1956 [1]; however, the literature review for this study shows that there are different theories concerning the meaning of the term geotourism. Geotourism is a specific segment of tourism in academic research that emerged widely in the literature in the 1990s [2–4]. Geotourism was a new term coined to describe geological tourism [2]. The concept of geotourism [5] appeared in the 1990s as “geological” rather than “geographical” tourism [6]. Geotourism, regarded as geographical tourism, was first reported by the National Geographic Society [7]. The geological element focuses on geology and landscape and includes both “form”, such as landforms, rock outcrops, rock types, sediments, soils and crystals, and “process”, such as volcanism, erosion, glaciation, etc. [8]. The geographic element focuses on geotourism as a “tourism that sustains or enhances the distinctive geographical character of a place—its environment, heritage, aesthetics, culture and the well-being of its residents” [9]. Thus, geotourism can be seen geologically as the appreciation of geology and landscape or geographically as travelling to areas of either great natural beauty or unique geographical phenomena [6].

The scientific literature reveals a multitude of concepts and understandings concerning geotourism [10–13]. These studies mainly focused on geodiversity, geoconservation, geoheritage and geosites. However, these concepts have often been misused or confused [14,15]. To address this, the study by Ólafsdóttir and Tverijonaite [16] identifies a need for a larger body of empirical research focusing on (i) the sustainability of geotourism, including the actual impacts of geotourism on the geoheritage and the ecosystems of geotourism areas; (ii) knowledge of the effective management of the main challenges of geotourism, as well as (iii) on stakeholders and their complex interrelations, including the effects of geotourism on local communities and their well-being. Previous studies indicated that geotourism has not been recognised by government authorities as a tourism branch that can foster regional development [4,6,8,11,16]. In addition, the challenge to geotourism in any region is to develop its tourism capacity [3]. This could be because geotourism is a “new phenomena with limited data” [1] (p. 26), especially in Africa. These challenges of geotourism require appropriate research on the challenges of geotourism at selected geosites [3]. Despite the rich geological history of South Africa, South Africa is still lagging in terms of geotourism research and the challenges involved [17,18]. Additionally, because geotourism is a new phenomenon with limited data, further research is needed to improve its understanding, especially in Africa [1].

Therefore, this study seeks to bridge this knowledge chasm by focusing specifically on the challenges of geotourism in the Kruger National Park (KNP) and also recommends measures to address these challenges. This paper is structured as follows. Section 2 provides a review of the literature and a global overview of geotourism research, geotourism in South Africa and tourism’s impact on the South African economy in relation to the KNP. Section 3 describes the study area, while Section 4 summarises the materials and methods employed. Subsequently, the results are discussed in Section 5. Finally, conclusions are drawn and recommendations are made in Section 6, while the limitations of the study are highlighted in Section 5.8.

2. Review of the Literature

2.1. Geotourism Research: Global Overview

Geotourism is a form of tourism that sustains and enhances the identity of a territory, by taking into consideration the territory’s geology, environment, culture, aesthetics, heritage and the well-being of its local surrounding residents [19]. As geotourism relates to the territorial identity of an area, the United Nations Educational Scientific and Cultural Organization (UNESCO) Global Geoparks (UGGp) recognised geoparks as important for geotourism development. A geopark territory refers to “single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development” [20]. In this sense, geotourism, as a special type of tourism that is “geological based” and a territorial and tourism approach that is “geographical based”, is not exclusive of UGGps; it could be more fomented on territorial development strategic plans for the sustainable development goals (SDGs) [21].

In recent decades, geotourism research has experienced growth around the world and will continue to be prominent in the future [21]. A 2015 study by Ruban [11] analysed the number of specialists’ published journal articles on geotourism between 2012 and 2014 per study region. Geotourism research is concentrated in Europe (mainly in Italy and Poland), Asia (mainly in China and Iran) and South America (mainly in Brazil) [11]. Similarly, the global distribution of geotourism research reveals that in 2018, the largest share of geotourism research was conducted in Europe, with only a total of 19 studies that were conducted in Africa (Figure 1) [22].

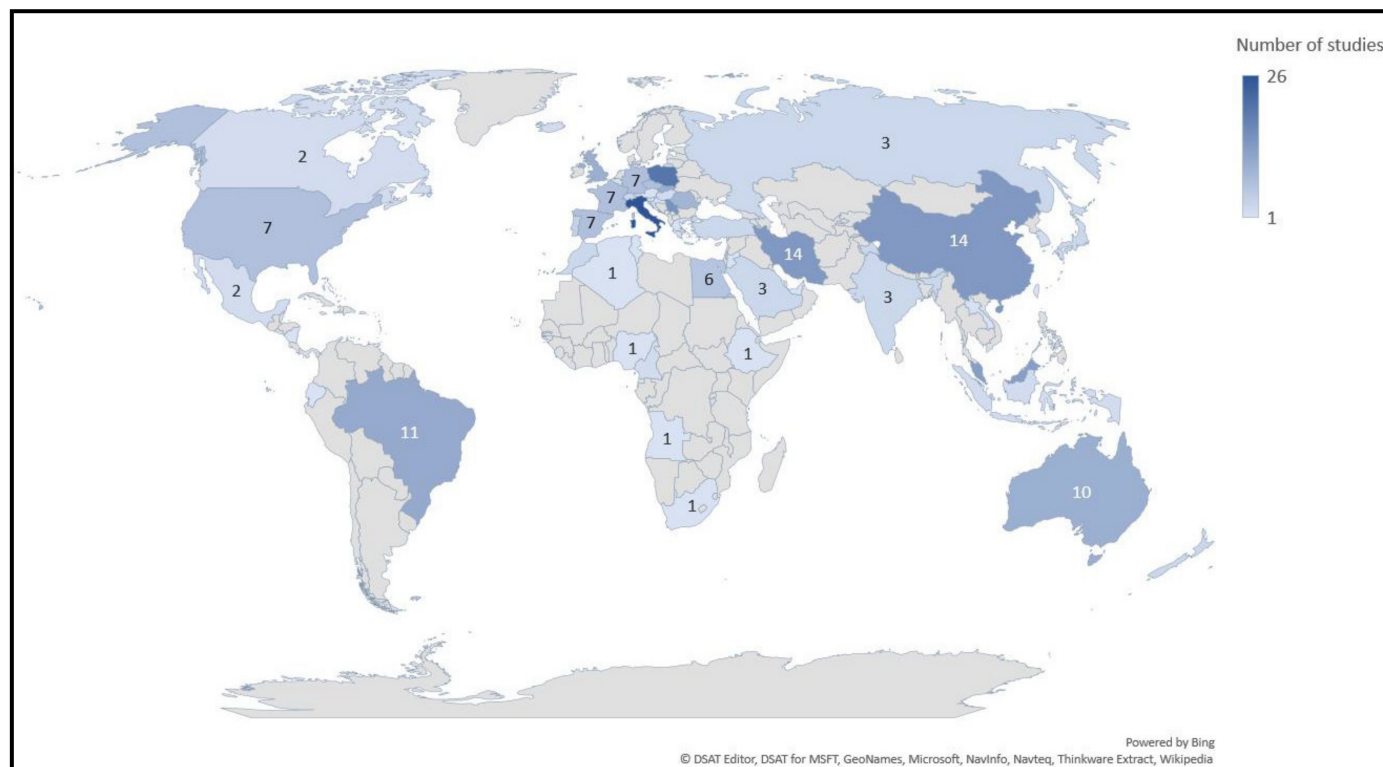


Figure 1. Geographical distribution of research studies on geotourism [22].

A 2020 study [21] analysed the countries with the most publications on geotourism and development (2007–2018). The country with the most geotourism studies was Brazil, with 17 articles published, followed by Australia (16), Italy (14) and the UK (13). Other countries with less than 10 documents published were the USA (8), Poland and Portugal (7 each), France and Malaysia (6 each) and Serbia (5) [21] (Figure 2).

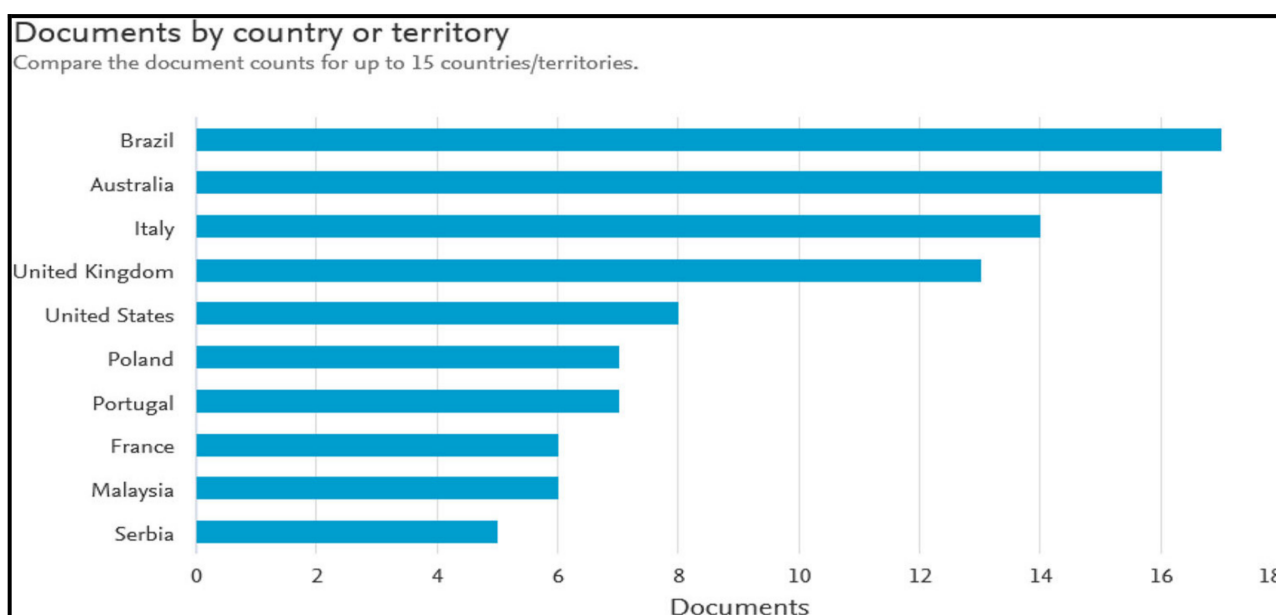


Figure 2. Top 10 countries with publications on geotourism and development (2007–2018) [21].

However, South Africa is still lagging in terms of geotourism research compared to other countries. This shows that geotourism research is dominated by western theories.

Western tourism theories cannot fully explain tourism dynamics in developing countries such as South Africa, mainly due to deep cultural, political and historical differences between the two groups [23]. This indicates that the current literature on geotourism does not explore the challenges of geotourism and challenges that may be unique to African countries and South Africa in particular.

It was, therefore, important to conduct this research to contribute towards improving geotourism knowledge in South Africa and Africa at large. Given the research objective of this paper, it was necessary to consider the challenges of geotourism in South Africa, especially at the KNP.

2.2. Geotourism in South Africa: History and Challenges in the Context of the Kruger National Park

Geotourism in South Africa is mainly governed by the National Heritage Resources Act, Act No. 25 of 1999 (NHRA). Among the other important acts and regulations are the Cultural Institutions Act, 1998, the World Heritage Convention Act, 1999, and the Minerals and Petroleum Resources Development Act. Provincial laws and ordinances and local by-laws also add to the regulatory regime of these heritage resources at provincial and local levels.

The NHRA does not explicitly define geotourism; however, Section 3 identifies geological sites (geoheritage sites) of scientific and cultural importance as a national estate. One of the objectives of the NHRA is to nurture and conserve heritage resources for the benefit of current and future generations. However, the National Department of Science and Technology (NDST) indicates that an enduring legacy of the apartheid era is that the richness of South Africa's fossil and archaeological heritage is not matched by a corresponding public passion and appreciation [24].

Concerning this study, current knowledge of heritage resources within protected areas is extremely limited [25]. The KNP is under the management of South African National Parks (SANParks). The SANParks is governed by the National Environmental Management: Protected Areas Act, Act No. 57 of 2003 (NEM: PAA). The NEM: PAA mandates SANParks to create destinations for nature-based tourism in a manner that is not harmful to the environment. This mandate covers the inventory and management of geoheritage sites within the KNP. Nevertheless, not all geoheritage sites have been identified and ranked for geotourism development within the KNP. Consequently, the challenges of geotourism are not understood and measures to address these challenges are not in place [26].

Although the strategic and legislative framework for protecting South Africa's heritage resources has been in operation for more than a decade, it has neither achieved the desired level of heritage management and protection nor the adequate development of the heritage sector [24]. Moreover, while legislations exist in South Africa to pursue and implement the protection of geological sites, a lack of manpower and funding does present persistent problems [27–29]. Geotourism in South Africa has not been effectively developed and promoted by the National Department of Tourism (NDT). Reasons for this include a lack of institutional and public participation in geology [27], lack of data on important geological or geomorphological sites [30], the conflation of geological with other ecological and cultural heritage issues [27] and problems with relevant legislation and management [29,31,32]. These further suggest that the NHRA and NEM: PAA are not being fully implemented. These reasons are not based on any field investigations but on observations. Therefore, this study is unique as it looks at a case study and will add value in order to achieve the desired objectives as set out in the NHRA and NEM: PAA.

2.3. Tourism Impact on the South African Economy: In Relation to the Kruger National Park

In 2018, tourism contributed around USD 28.2 billion to the South African economy generated, which represents 8.6% of the total economy and 9.2% of the total employment in the country [33]. In 2018/19, the total tourist foreign direct spend increased by 6.6% to an estimated USD 5.8 billion, from USD 5.4 billion in 2017/18. In 2018/19, 18.7 million

domestic trips were taken in South Africa, injecting USD 1.9 billion in direct spending into the country's economy, with visiting friends and relatives being the main reason [33].

Tourism revenue at SANParks has grown by 6% to approximately USD 133 million, from USD 113 million achieved in the previous year [34]. During 2019/20, SANParks welcomed over 6.3 million visitors, with over 1.8 million attributed to the KNP. The KNP attracts large numbers of tourists/visitors, whose spending generates in excess of USD 133 million per annum. According to South African Tourism [33], the UK is the largest single country for international tourism to South Africa, while most of the domestic tourists during 2018 in South Africa (36.4%) were from Gauteng Province. Moreover, the income generated by the KNP is significantly more than any other park in South Africa [35]. The main attraction for visitors to the KNP is wildlife viewing [36,37]. Neglecting the importance of geotourism when receiving visitors to the area is a missed opportunity for local communities to fully benefit from sustainable tourism [17]. Therefore, addressing the challenges of geotourism at the KNP will assist in unlocking new opportunities and benefits for local communities.

3. Study Area

This paper conducted an empirical investigation, reporting on a case study to investigate the challenges of geotourism at the KNP, with emphasis on the northern part (Figures 3 and 4). The KNP is located in the northeastern corner of South Africa. The park is the largest national park in Africa and one of the top tourist destinations in the world [38,39]. It covers approximately 20,000 square kilometres (equivalent to 12,428 miles) [39] and extends through South Africa's Limpopo province in the north and into the Mpumalanga province in the south. The KNP also borders the countries of Zimbabwe in the north and Mozambique in the east (Figures 3 and 4). The KNP interacts with eight local municipalities, which fall within three larger district municipalities, namely Vhembe, Mopani and Ehlanzeni. The park has nine entrance gates (Pafuri, Punda Maria, Phalaborwa, Orpen, Paul Kruger, Phabeni, Numbi, Malelane and Crocodile Bridge) and contains several tourist overnight rest camps (Figure 3).

Additionally, two international gateways are exiting from the park at two border posts to Mozambique at Pafuri and Gariyondo, which link the KNP to the Limpopo National Park in Mozambique [35]. There are four airfields (Skukuza, Hoedspruit, Phalaborwa and Kruger Mpumalanga International Airport) accessible to tourists within (Skukuza) and around the KNP.

The KNP was initially founded as the Sabie Game Reserve in 1902 [38] and later officially proclaimed as a national park in 1926 [40]. The history of the KNP has been the site of clashes between the former provincial administrations and central government regarding its boundaries before 1994 [41]. Several black communities, such as the Makuleke, Ntimane, Muyexe, Ba-Phalaborwa, Mhlanganisweni, Mathebula Ngrivhane and Mahashi, were forcibly removed from their land by the apartheid government of South Africa to increase the size of the KNP [42].

The local communities bordering the national parks such as the KNP (Figure 3) are poor and underdeveloped [43–45]. As previous research shows [17], the unemployment rate of local communities abutting the northern part of the KNP is 48.8% and 62.2% for youth [46]. Venda-speaking people are found in the northern region of South Africa [47]. The main language spoken in this region is Tshivenda or Venda. The Venda people in the Limpopo province (Figure 4) share a border with Zimbabwe and the southeastern side of Mozambique. Venda-speaking people in Limpopo live in areas that are still classified as “rural” in South Africa, with little access to opportunities to develop sustainable businesses. This highlights the need to create opportunities for the Venda people to develop businesses using the natural resources of the northern areas of the KNP [48,49]. The geoheritage sites exposed in the KNP (Figure 4) have shown potential to support geotourism development at the KNP [17,18].

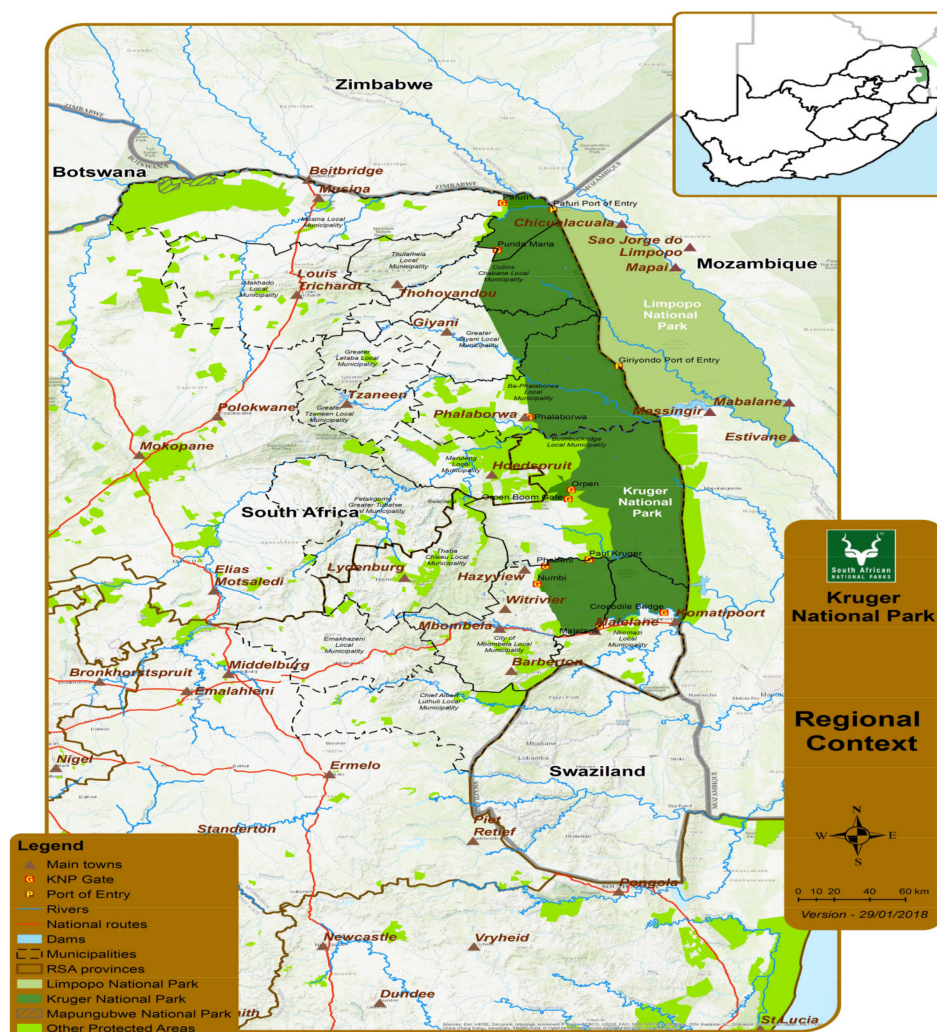


Figure 3. Regional location of the Kruger National Park [33].

For instance, as regards untapped geotourism potential, for the Venda communities abutting the north of the KNP (Figure 4), there are exemplary geoheritage sites with both very high geotourism and cultural value that are currently totally un-utilised for geotourism. These include:

- Thulamela (#1), showing a circular sandstone wall reconstruction of the Venda chief's home and traditional court;
- Shaluka (#5) and Nkovakulu (#11), revealing spectacular vesicular and amygdaloidal basalt packed in circular form indicating ruins of old dwellings of the Venda people;
- Makahane (#9), dinosaur remains;
- A basalt sofa (#13), formed by a volcano millions of years ago;
- Mashikiri (#12), rock art lines inside the concave cave indicating the presence of the ancient hominids;
- Kremetart (#14), presenting ancient graves, portholes and important geological structures such as beddings, joints, faults and ripple marks;
- Malonga Diamond Prospecting Pit (#15), offering gemstones and natural springs as attractions.

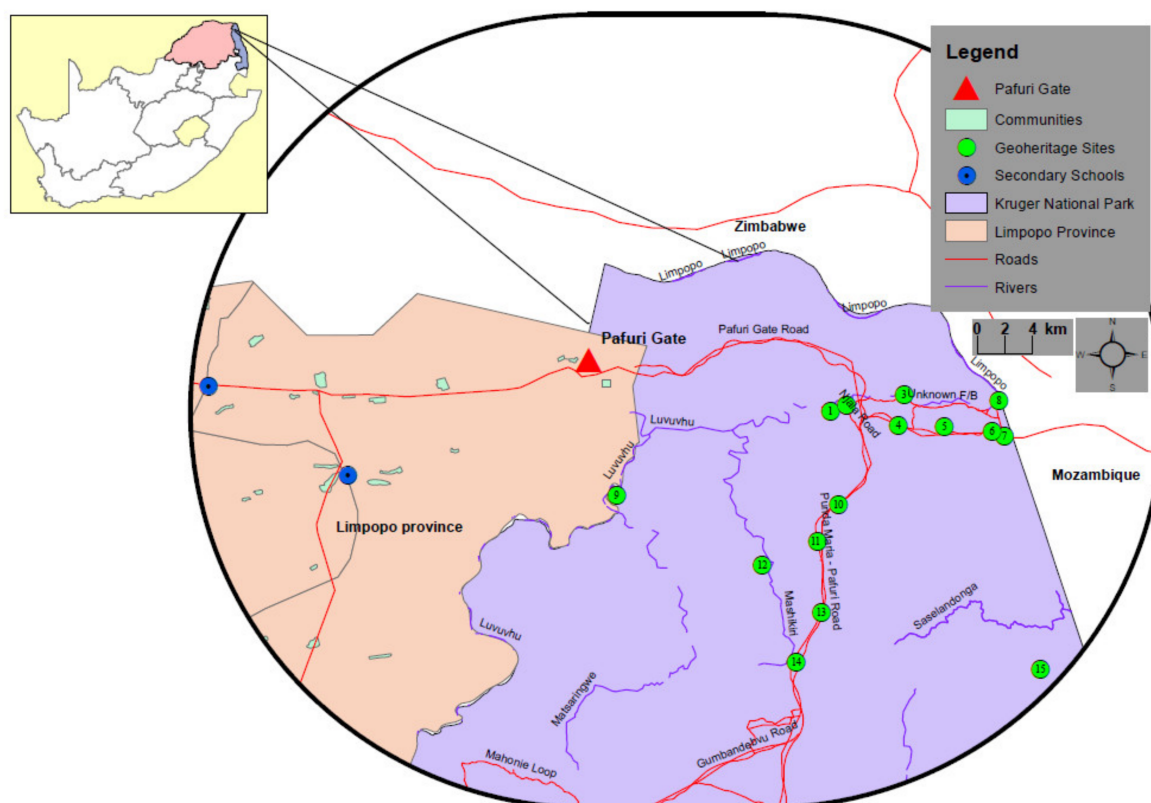


Figure 4. Location of the study area showing geoheritage sites and abutting communities at the northern part of the KNP. 1, Thulamela; 2, Bobomeni Waterfall; 3, Old Pafuri Tent Camp; 4, Basalt Boulder; 5, Shaluka; 6, Butchers Store; 7, Wenela; 8, Crooks Corner; 9, Makahane; 10, Baobab Hill; 11, Nkovakulu; 12, Mashikiri; 13, A basalt sofa; 14, Kremetart; 15, Malonga Diamond Prospecting Pit (Source: First Author).

Geology of the Study Area

The geology and topography of the KNP is shown in Figure 5. The rocks of KNP played an important role in shaping the culture of the local people. For example, Verhoef [50] shows that men from the northern part of the KNP used local rocks to manufacture weapons for hunting or battle, and iron from melted rocks for tools for agriculture, mining and ornaments. The KNP was mapped geologically from 1970 to 1980 [51]. This mapping found that evidence of rock types of the Archaean basement terrain underlies the western portion of the park and ranges from ancient gneiss with komatiitic greenstone xenoliths to potassic granites, which give rise to the inselbergs of southern KNP [52]. Karoo basaltic lava plains underlie much of the eastern portion of KNP and give rise to dark brown to black clay-rich soils with their distinctive vegetation types. Excellent exposures of lava flows can be seen in the valleys and mini gorges of eastern KNP and these are great assets for a geotourism trail. In addition, more than 300 archaeological sites of Stone Age man have been found and there are significant archaeological ruins at Thulamela and Masorini [53]. The extreme north of the KNP is unique due to its diverse assemblage of rock formations [54]. Furthermore, the rich geological history of the KNP can be used for attracting geotourists by organising different itineraries and as a tool for education, and it can facilitate knowledge transfer and scientific learning among infants and schoolchildren [55–57].

The study area comprises low-lying landscapes with flat to concave topography, steep slopes, undulating terrains and regular koppies (small hills) [58]. These geological and topographical features offer an opportunity for geotourism development at the KNP.

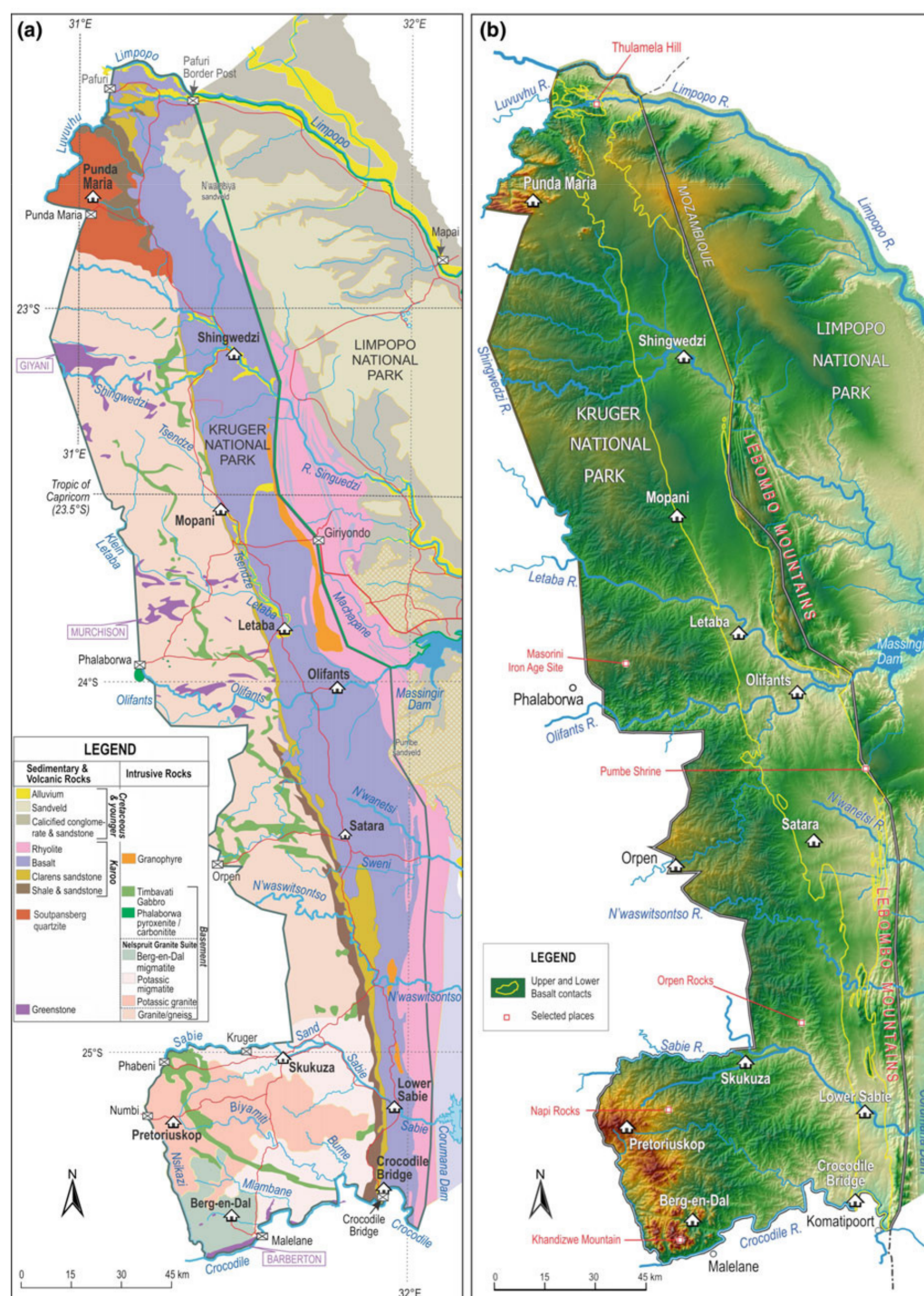


Figure 5. (a) Geological map of Kruger and the western sector of the Transfrontier Limpopo National Park; (b) digital terrain image covering the same area. Comparison of the two highlights the relationship between geology and topography [59].

4. Materials and Methods

4.1. Research Design

Qualitative, open-ended and semi-structured interviews were used to collect detailed data from key stakeholders such as SANParks officials, the NDT government officials and community high school teachers within the Mutele Tribal Authority (MTA), representatives or leaders of local communities within the MTA, residents of the MTA as well as executives and tour operators from the Limpopo Tourism Agency (LTA). These are listed in Table 1.

Table 1. Semi-structured interviews conducted.

Participants Involved	Number of Semi-Structured Interviews and Participant Codes	Input of Participant
SANParks staff	4—AVJ, KM, JS, TK	To identify and understand the organisational challenges of geotourism.
NDT government officials	3—TM, BM, MB	To identify and understand the national challenges of geotourism. To identify the roles and responsibilities of government in geotourism.
LTA	1—MM2	To identify and understand the provincial challenges of geotourism.
High school teachers	2—NLC, MBR	To identify and understand the educational challenges of geotourism.
Representatives or leaders of local communities	2—R, TS	To understand what challenges local community leaders are facing in relation to geotourism.
Local residents	2—PM, TI	To understand what challenges local residents are facing in relation to geotourism.
Tour operators	2—AY, MM1	To identify and understand the tourism industry challenges of geotourism.
Total number of interviews	16	

Source: Authors.

A purposive sampling strategy was used to gather the data. Participants were selected based on their unique knowledge and/or understanding of the topic [60,61] and to “achieve representativeness” [62] (p. 235). The sample size was determined by the willingness and availability of the participants to take part in this research. Unfortunately, of the 17 anticipated interviews, one participant from SANParks and one tour operator opted not to participate. Several attempts (sending e-mails and making telephone calls) to secure interviews with these participants proved fruitless, leaving 15 participants. The NDT government officials who participated suggested a third participant, giving a final total of 16 participants.

The semi-structured interviews were open-ended in nature to elicit views and opinions from the participants. By using open-ended questions, the participants were able to freely express their opinions [63,64]. Predetermined key questions were asked in each interview based on the constructs of social sustainability and geotourism, which informed the interview guide [65]. The interviews sought to elicit information on participants’ demographics; geotourism and social sustainability (with a focus on local community benefits such as job creation and poverty alleviation); stakeholder participation; knowledge and research on geotourism; and the potential of geotourism and its challenges. The interviews were digitally recorded and then transcribed. The characteristics of the participants are shown in Table 2.

4.2. Data Analysis

The data were analysed using a general inductive approach by way of content analysis. The verbatim responses were coded into a meaningful set of categories. Creswell’s [66] six steps of data analysis and interpretation were followed, namely (i) organise and prepare the data for analysis, (ii) read or look at all the data, (iii) start coding all the data, (iv) use the coding process to generate a description of the setting or people as well as categories or themes for analysis, (v) advance how the description and themes will be represented in the qualitative narrative and (vi) interpret the data. Manual coding allowed for the recognition of errors in the classification of variables and enabled the researcher to reflect on the participants’ responses. This also allowed for the identification of themes, which may have been missed by an automated coding system or software program (computer-aided coding system).

Table 2. Characteristics of participants interviewed.

Participants Involved	Role	Highest Level of Education	Age Group	Gender	Race
SANParks staff (AVJ)	Head of Unit	Degree	50–59	Female	White
SANParks staff (JS)	General Manager	Degree	50–59	Male	White
SANParks staff (KM)	General Manager	Masters	50–59	Male	White
SANParks staff (TK)	General Manager	Masters	40–49	Male	Black
NDT government official (TM)	Director	PhD	40–49	Male	Black
NDT government official (BM)	Chief Director	Masters	40–49	Male	White
NDT government official (MB)	Chief Director	Degree	50–59	Female	Coloured
LTA (MM2)	Executive	PhD	50–59	Male	Black
High school teacher (NLC)	Geography Teacher	Degree	40–49	Male	Black
High school teacher (MBR)	Geography Teacher	Diploma	50–59	Male	Black
Leader of local community (R)	Representative	Grade 10	40–49	Male	Black
Leader of local community (TS)	Representative	No education	>70	Female	Black
Local resident (PM)	Resident	Honours	30–39	Male	Black
Local resident (TI)	Resident	Grade 12	20–29	Male	Black
Tour operator (AY)	Owner	Not provided	Not provided	Female	White
Tour operator (MM1)	Supervisor	Grade 12	30–39	Female	Black
Total number of interviews		16			

5. Results and Discussion

A significant finding was that there were seven sub-themes related to the challenges of geotourism that emerged from the content analysis, namely

- (i) Lack of packaging and marketing;
- (ii) Lack of infrastructure (environmentally friendly infrastructure such as roads and toilets);
- (iii) Security and access to geoheritage sites;
- (iv) Access to finance and markets (access to funding, access to the tourism sector and empowering the capacity and capabilities of companies, especially the local and previously disadvantaged small, medium and micro-enterprises (SMMEs) and creating access to opportunities in the industry);
- (v) Destruction of geoheritage sites (natural and anthropogenic);
- (vi) Social challenges (lack of education and awareness, lack of employment and business opportunities, lack of community participation, community resistance to local social sustainability and a lack of human capacity in the local communities); and
- (vii) Regulatory challenges (lack of compliance with legislation, lack of legislative regulations to protect geoheritage sites and regulatory difficulties in registration of local tour operators and guides).

This information drawn from the data also provided insights into the similarities and differences among the participants and the reasons for their perceived challenges of geotourism. Participants highlighted seven sub-themes regarding the challenges of geotourism, as indicated in Table 3.

Table 3. Views of participants interviewed relating to challenges of geotourism.

Types of Challenges (Sub-Themes)	Participant Group						
	SANParks	Government	Representatives of Local Communities	Local Residents	Tourism Agency	Tour Operators	High School Teachers
Lack of packaging and marketing	✓	✓	X	X	✓	✓	X
Lack of infrastructure	✓	✓	X	✓	X	X	X
Security and access to the geoheritage sites	✓	✓	✓	✓	✓	✓	✓
Lack of access to finance and markets	✓	✓	✓	✓	✓	✓	X
Destruction of geoheritage sites	✓	✓	✓	✓	✓	X	✓
Social challenges	✓	✓	✓	✓	✓	✓	✓
Regulatory challenges	✓	✓	✓	X	✓	✓	X

Source: Authors.

5.1. Sub-Theme 1: Lack of Packaging and Marketing

The results of this study indicate that the lack of packaging and marketing of geotourism at the KNP was a common challenge that most participants frequently mentioned, especially participants from SANParks, the government, the tourism agency and tour operators. This means that tourists and people generally are not aware of geotourism as a potentially new form of tourism at the KNP.

Due to the lack of packages and marketing focusing on geoheritage sites, there was a concern that this could lead to geotourism not being developed. This was noted to have already occurred with tourists interested in geotourism, where SANParks was not ready to facilitate this customer need due to a lack of packaging and marketing to visit these geoheritage sites. Sometimes, tourists were already aware of certain geoheritage sites inside the park, but SANParks seemed not to be ready for geotourism as a new tourism product. As participant JS, a SANParks official, noted, regarding the lack of packaging and marketing of geotourism,

“... Because currently tourists visit the park, drive to Punda Maria. I don't stop outside the park to buy ... in fact I don't spend any money in the local communities. We need to work on tourists spending more time outside the park, spending money and making local economy grow ... But at the moment that is not how it is packaged...”

It was further noted by participant JS that a lack of proper leadership and incentives to drive geotourism product development was an issue that could hinder the development of geotourism at the KNP. This view was also supported by participant KM, a SANParks official who indicated that, regarding the priority challenge that is hindering the development of geotourism at the northern part of the KNP, “It [geotourism] needs a champion”. These views suggest that, currently, there is no person or department at SANParks that is tasked with the development of geotourism and also there are no incentives for developing new tourism products such as geotourism. This further highlights internal management deficiencies at SANParks.

Participant AY, a SANParks official, noted the need for SANParks to develop packages including geotourism. Tour operators would be able to sell these packages and charge suitable fees to tourists. Participant AY further noted that only a few tour companies are operating in the northern part of the KNP, which could be explained by the lack of packaging and marketing of geotourism by SANParks. Similarly, all NDT government officials noted a lack of packaging as a major challenge to tourism diversification and specialisation, such as geotourism development at the KNP. This is in line with previous studies. According to the International Labour Organisation [67] (p. 45), “customers

are increasingly concerned about the environment, particularly the use of less carbon-intensive products and are looking for sustainable travel packages that include recognition of social and environmental issues, of—green tourism services and of the principles of—ecotourism”. Research by Weidenfeld [68] also shows that packaging is important, especially for tourism diversification and specialisation. A study by Makhaola [69] found that the lack of packaging impacts negatively on tourism, especially domestic tourism.

5.2. Sub-Theme 2: Lack of Infrastructure

Linked to a lack of packaging and marketing was an emerging sub-theme on the lack of infrastructure such as roads and toilets to support geotourism. Participants from SANParks and NDT government officials had mixed views regarding the infrastructure required to develop geotourism at the KNP. Two SANParks participants indicated that the KNP had sufficient infrastructure, while the other two SANParks officials highlighted that the KNP did not have enough infrastructure to support geotourism.

Similarly, NDT government officials were not unanimous in terms of the required facilities and infrastructure to support geotourism in the northern part of the KNP. Two out of three NDT government participants indicated that there was a lack of facilities and infrastructure to support the development of geotourism in the northern part of KNP, while one participant MB highlighted that KNP had sufficient facilities and infrastructure to support geotourism and stated that “The KNP should be left as it is and we can develop outside the park so that the communities can also benefit...”.

Although these are the opinions of the participants, the empirical findings of this study suggest that the KNP does not have sufficient facilities and infrastructure to support geotourism development. Previous studies have shown that a lack of good facilities and infrastructure can decrease the attractiveness of a tourism destination such as the KNP [70]. Therefore, the lack of good facilities and infrastructure to support geotourism suggests that tourists may find geoheritage sites at the KNP less attractive. This also refers to facilities and infrastructure in the local communities abutting the northern part of the KNP. Issues such as the crumbling neighbourhood infrastructure have traditionally been overlooked by a sustainability agenda that tends to focus on “green” issues of ecosystem conservation rather than “brown” issues of inequality [71]. According to Mitchell and Faal [72], the lack of infrastructure may effectively block or hinder tourism development. Therefore, solutions to the challenge of a lack of infrastructure to support geotourism development at the KNP should be considered. In this context, the government or SANParks should provide environmentally friendly infrastructure such as roads and toilets within and around the geoheritage sites. This is in line with studies by Martin [73], Chakraborty and Jones [74] and Cooper [75]. The lack of access roads to geoheritage sites should be addressed immediately by building an environmentally friendly road network. It is also important that the access road infrastructure considers physically disabled tourists. The government and SANParks should provide environmentally friendly facilities at all or some geoheritage sites.

5.3. Sub-Theme 3: Security and Access to Geoheritage Sites

The findings show that security and access to geoheritage sites by tourists and local communities is an important issue that requires attention by SANParks and the government. The findings of this study also suggest that the lack of trained human resources for geotourism (a type of infrastructural challenge) is one of the challenges hindering access to geoheritage sites. In this context, participant JS, a SANParks official, demonstrated that,

“... people [tourists and local communities] want to go to Thulamela and we (SANParks) sometimes make it difficult because we don’t set up the product so that people can visit easily. So if people come to Punda Maria and say can we do Thulamela and we say ohh let’s see if it is doable and ask someone if he is available and he is actually not available because he is actually doing another job.”

In addition, the issue of safety and security is a challenge hindering the development of geotourism in the KNP. As participant TK, a SANParks official, revealed,

“I think logistically we [SANParks] will need to provide safety. Physical safety where people can get to places where they can fall and get injured as well as safety against animals. But those are things that can be managed . . . have necessary armed guides who will be guiding the tours...”

These views indicate that SANParks should ensure the security and safety of tourists visiting the KNP against attack by wild animals, injury by poachers and falling or injury due to unstable areas. In addition, the findings of this study indicate the need to make sure that disabled people are considered when dealing with the challenge of security and access to geoheritage sites. The findings of this study also highlight that the sacredness or spirituality of geoheritage sites should be protected and secured when visiting these geoheritage sites.

Therefore, cultural ethics must be observed and secured at all times when tourists are visiting these geoheritage sites. This view supports the literature stating that geotourism offers a positive attitude and behaviour towards local culture (e.g., respect towards traditional use and local beliefs) and a realistic solution to the apparent conflict between environmental and cultural protection [76]. These findings that security and access to geoheritage sites by tourists are a challenge for geotourism development are corroborated by previous studies [77–79]. According to Dwyer et al. [77], safety and security are the foundation for the development of sustainable tourism. If the destination lacks safety and security, the flow of tourists will be constrained. Security allows tourists to feel confident that they are visiting safe and healthy geoheritage sites that will not endanger their safety (physical or mental). In addition, the lack of access to geoheritage sites is one of the main challenges towards geotourism development in South Africa [80–83]. In this context, security and access to geoheritage sites should also be conditioned by SANParks and the government to cater to large groups of tourists (for example, students or the general public) [78].

Making geoheritage sites accessible to tourists and local communities is also in line with the second pillar (facilitate ease of access) of the National Tourism Sector Strategy (NTSS) [84]. This means that geoheritage sites should be accessed easily, safely and as quickly as possible. However, the ease of access to geoheritage sites by tourists should be balanced by ensuring that tourists do not damage or misuse the geoheritage sites. As Brilha [78] (p. 130) cautions, “a site with easy access is more likely to be damaged by visitors’ misuse than one with difficult access”.

5.4. Sub-Theme 4: Access to Finance and Markets

The findings indicate that access to finance and markets emerged as one of the main challenges of geotourism. In this study, access to finance and markets means access to funding, access to the tourism sector and empowering the capacity and capabilities of companies, especially local and previously disadvantaged SMMEs. All participants except high school teachers raised access to finance and markets as a challenge in developing geotourism. These participants highlighted that access to finance is a huge challenge that is mainly caused by a lack of financial resources and sometimes misuses of available funds. For example, SANParks officials and NDT government officials indicated that the budget for geotourism development is not sufficient because there are many competing programs that need to be funded by the government. According to participant TM, an NDT government official, regarding a budget for geotourism development,

“ . . . we don’t have a budget for specifically geotourism . . . Government allocation can never be sufficient because the needs are huge. For example, you can make the allocation to look after the sites at KNP but you might find that the allocation is specifically for the conservation of that site but it does not allow for other facets that are related to the conservation of that site . . . The other thing is if you need to develop access around the

site in a controlled manner you don't have money for basic infrastructure but you actually have money just to protect the site."

This view shows there is a lack of finance to support the development of geotourism at the KNP due to the fact that the government is facing many challenges. However, the findings of this study also suggest a lack of interest and political will from the government to provide funding for geotourism. The findings of this research suggest that the lack of access to markets by local community-based businesses was caused by the monopoly of large tourism companies, thereby resisting local businesses' operation. As a result, participant JS, a SANParks official alluded to a lack of market access by local tour operators,

"... Small business fails because they don't have access to markets and monopoly, resisting people to operate and they don't share their business with small operations... We don't just say we like local business. We will say ok let's go and look and say okay they are responsible, they looked at the requirement of responsible tourism, they pay people, they are registered and everything..."

This view brings in another challenge wherein the small local tour companies need to comply with SANParks or government requirements. The view that a lack of access to finance and markets is a potential challenge that may hinder the development of geotourism is in line with previous studies. According to Roe and Khanya [85] (p. 2), local and poor communities have tourism assets but lack financial resources and access to tourism markets, which include "product and market development to ensure commercial realism". Similarly, research by Chili [86] (p. 7) indicated that the "lack of financial access and government support are an impediment" to the development of SMMEs in poor communities such as in the northern part of the KNP. As such, there is a need for the government or SANParks to improve access to finance and markets, especially for tourism SMMEs in the poor communities within and around the KNP. This is in line with research by Rogerson, Benkenstein and Mwongera [87] (p. 26) that suggested that there is a "need for improved access to finance/micro-credit to support marginalised communities to establish tourism businesses" such as geotourism. In this context, SANParks or the government should provide support services to SMMEs from local communities near national parks, especially around the northern part of the KNP, in order to improve access to finance and ensure that all relevant information is made available to all role players in the tourism market, including local SMMEs, a notion supported by Osano and Languitane [88]. Furthermore, the government should provide some financial support to SANParks in order to develop geotourism at the KNP.

5.5. Sub-Theme 5: Destruction of Geoheritage Sites

Another sub-theme on challenges of geotourism that emerged from participants was the destruction of geoheritage sites. All participant groups except tour operators highlighted the destruction of geoheritage sites as a potential challenge that could hinder the development of geotourism in the northern part of the KNP. The findings revealed that geoheritage sites at the KNP are not protected and this could lead, if left unaddressed, to the destruction of geoheritage sites by natural processes and humans.

Although many participants noted that they do not see any negative impacts relating to geotourism because it is not destructive, unfortunately, natural processes such as floods and climate change can damage geoheritage sites, thereby limiting geotourism development. This supports views that natural events such as floods can damage tourism activities, as supported by Christian [89] and CNN [90]. In addition, although many participants indicated that they do not see the negative impacts that geotourism can bring to the local communities, according to participant TM, an NDT government official, "Because communities are not aware of these sites, therefore, they don't see any value. Sometimes they will even destroy the site."

Human activities such as mining and deforestation could also have negative impacts on geotourism. As participant KM, a SANParks official, noted,

“... the greatest threat to geological sites is mining ... So you can have spectacular geological site that gets mined and it's gone. It's not like biology where you can put cattle in an area and you can overgraze it for 20 years and take them out and recover it. Geological damage is permanent and it's gone forever.”

To support this, participant R, a leader of a local community, agreed that destroying rocks inside the KNP is not good as these rocks are not renewable once destroyed. Participant R further noted that if these geoheritage sites are destroyed, the new generation will not know about them. In addition, participant BM, an NDT government official, noted that human impacts such as “environmental impacts due to overcrowding, littering, people destroying plants” can lead to negative perceptions about geotourism. Therefore, geotourism must be practiced in a sustainable manner that does take into consideration future generations and cultural heritage.

The finding that anthropogenic activities such as mining and damage to geoheritage sites are challenges for geotourism development is in line with previous studies. For example, a study by Leonard [91] (p. 249) indicated that “besides the short-term jobs offered by mining, the precautionary principle, as suggested in South African regulations, should apply against mining development since there are added threats of serious or irreversible environmental degradation which does not support sustainable tourism development and long-term jobs.” In this context, tourism development does not only create jobs in hotels, lodges and restaurants, but employment positions in a plethora of other sectors including construction, food supplies and repair services, also indicating the importance of tourism-related linkages and employment generation—suggesting that the total number of tourism jobs is unknown since a full socioeconomic analysis of tourism job pathways has yet to be conducted [92].

5.6. Sub-Theme 6: Social Challenges

Linked to the destruction of geoheritage sites, all participants were concerned about the social challenges of geotourism (Table 3). Participants indicated that social challenges, such as a lack of education and awareness, lack of employment and business opportunities, lack of community participation, community resistance to local social sustainability and a lack of human capacity in the local communities, are hindering the development of geotourism in the KNP. For example, according to participant BM, an NDT government official, referring to the priority challenge hindering the development of geotourism,

“... is awareness amongst different stakeholders. Among SANParks itself, their focus is on conservation. I think they need awareness of geological assets they have, they may not see it as potential geotourism product. If you create awareness among SANParks management and staff/employee about why there is geotourism, why it is important, why it is important to conserve it, what benefits does it bring within SANParks itself?. Then the same awareness with communities and in the tourism industry to say here is the opportunity that I can be package and sell as a business ... I think [geotourism] awareness is a big one [challenge] ... ”

This shows that there is a lack of geotourism knowledge and awareness amongst various stakeholders, which is hindering geotourism development at the KNP. This view was supported by participant TK, a SANParks official, who highlighted that,

“... the whole issue when you are dealing with community leaders. You find that you are engaging with the community leaders but down the line you find somebody [new]. There are disputes all the time from the communities on who told you that this is our leader we elected that one, we don't know him and things like that and you have split up groups. You find in-fighting among the communities. These are some of the challenges that make it difficult to run proper programs. They think somebody is getting the benefits and so and so is not. So you don't always get communities that are well organised.”

This suggests that local chiefs are not sharing information or benefits from SANParks or the government with the local communities, which creates mistrust between the parties.

Although there are different priorities among the community members, the results of this study show that local communities in the northern part of the KNP do not trust SANParks. As noted by participant JS, a SANParks official, “Local communities don’t trust SANParks.” The findings suggest that the lack of trust by local communities is due to a lack of proper leadership and a lack of common understanding among stakeholders. As participant BM, an NDT government official, indicated,

“Often the community is resistant to something for whatever the reasons. Very often it is the lack of information that causes that. Maybe the leadership in that community is old and don’t see the new opportunities, they are stuck in the old way of doing things and we are in charge . . . I think that is a problem where the youngsters will have a different understanding and see the opportunity while the elders don’t see it. So there is conflict and lack of common understanding. The other challenge is communities are often poor in general, that level of importance they give to something need to talk to their immediate benefits . . . Then there issues of trust . . . Sometimes Non-Governmental Organizations (NGOs) promises the communities things they can’t fulfil and they disappear and then the communities loose trust because this person promised us things and then they disappear . . . ”

This view indicates the lack of coherence and common understanding amongst the local community leaders and community members, which decreases the prospect of geotourism development. Furthermore, the findings show that issues of land, empty promises by NGOs and politics are some of the challenges of geotourism. The issue of empty promises by SANParks was noted by representatives of the local community leaders. Furthermore, many participants highlighted that local people in the northern part of the KNP are suffering from a high unemployment and poverty rate. In this context, participant TS, a leader of a local community, noted that “youth unemployment” was a major issue facing the local communities and could hinder the development of geotourism. The findings of this study suggest that the high unemployment and poverty rate of the local communities in the northern part of the KNP is partly caused by a lack of community participation in tourism activities at the KNP. In this case, representatives of local community leaders and local residents noted that they were not involved in the planning of tourism activities at the KNP and indicated that SANParks and the government impose plans on them. As participant PM, a local resident, noted,

“ . . . It is like top bottom approach. They [local residents] are not involved in planning. They are just being told that is what we are going to do. That is why they are not fully involved in tourism. The communities need to be heard on what they want to happen and how they can be involved in tourism . . . ”

It was further indicated that there are no structures for local communities to raise their views on geotourism. This resulted in local communities being unhappy as companies and people coming from far outside the KNP were given business opportunities and employment at the expense of local residents. Geotourism involves participation in making decisions, local capacity development and equity [1,3,8,16–18]. With this in mind, it is important to highlight that without enough stakeholder participation and human capacity, it will be difficult to develop geotourism in South Africa, particularly in the KNP.

The lack of capacity was noted by all participants except tour operators. In this context, a lack of capacity refers to a lack of human capacity including local communities. For example, local residents raised the issue that the capacity building of local communities is an important issue that must be considered when developing geotourism. As participant PM noted, “ . . . But due to the fact that there is not enough capacity [at local communities] you find that they misused the funding and never materialised.”

This view was supported by participant KM, a SANParks official, who noted that,

“ . . . The capacity of the community to actually embrace opportunities. Sometimes communities are so incapacitated that they actually can’t see the benefits of doing certain things . . . interventions fail because people [local communities] have been so disempow-

ered over such a long period of time that it becomes difficult for them to grab opportunity and run with it."

In terms of institutional human capacity, out of four SANParks participants, two participants indicated that SANParks has sufficient capacity, while the other two indicated that SANParks does not have the capacity to develop and support geotourism. However, the LTA executive and all government participants indicated that they do not have sufficient human capacity to develop and support geotourism. The lack of capacity to develop and support geotourism is a huge challenge for SANParks, the government and local communities, which is an indication that the potential for geotourism development has been ignored within the national, provincial and local spheres of the government. Therefore, once geotourism has been identified as a new tourism product, SANParks and the government need to determine the human resources required to develop and support geotourism. In this view, both SANParks and NDT government officials noted the need to determine the amount of human resources required in order to assist in allocating the budget for geotourism development.

The challenge of a lack of benefits derived by local communities is partly caused by a lack of human capacity and the lack of an appropriate framework that accounts simultaneously for positive and negative, tangible and intangible components that accrue to various stakeholders from tourism at SANParks [93]. Similarly, Biggs et al. [94] identified human and organisational capacity as one of the key constraints relating to tourism in national parks. Therefore, the lack of human capacity at SANParks, the government and local communities will hinder geotourism development. This is in line with previous studies by Wollenberg and Colfer [95] (p. 116), who noted that effective natural resource management requires the capacity to protect and monitor the quality of the resource.

5.7. Sub-Theme 6: Regulatory Challenges

Another sub-theme on the challenges of geotourism that emerged was regulatory challenges. Since the KNP is a national park, it is governed by NEM: PAA, alongside other acts such as NHRA. Geotourism requires that the regulatory environment is conducive. All participant groups, except local residents and high school teachers, highlighted regulatory challenges as a hindrance to geotourism development. The findings of this study indicate that, in order for geotourism to be introduced as a new tourism product, certain regulatory or compliance processes need to be followed. According to participant TK, a SANParks official,

"The NEM: PAA guides everything that we do as SANParks. It specifically establishes national parks. Everything that we do, things that needs environmental authorisation, we follow that Act. But then also in terms of the NHRA, as SANParks we develop the policy on cultural heritage management that stipulates that SANParks needs to adhere to NHRA. The cultural and heritage management policy is based on NHRA ... "

Although SANParks officials indicated that they are complying with NEM: PAA, this study indicates that the SANParks policy on cultural heritage management does not include guidelines on geotourism and the sustainable management of geoheritage sites at the KNP or any other national park. Furthermore, findings indicate that there is no specific legislation to govern the sustainable use of geoheritage sites at the KNP and in South Africa. However, before the introduction of geotourism as a new tourism product, SANParks is required by NEM: PAA and NHRA to have an inventory of all geoheritage sites inside the KNP. This view was supported by participant TM, an NDT government official, who confirmed that,

"... creating an inventory of natural assets is very important. Because an inventory seeks to have formal register in place of these assets so that these assets are registered officially as part of heritage resources under the NHRA. Under NEM: PAA they will be declared as environmental sites and so on ... From the planning point of view it is very important to have this inventory ... "

This view further indicates that the inventory of geoheritage sites plays a major role in the planning of any development in a national park. Nevertheless, the findings of this study have indicated already that there is no inventory of geoheritage sites at the KNP, which suggests non-compliance with legislative requirements set out in NEM: PAA and NHRA. This suggests that the legislative regulations to protect geoheritage sites are currently inadequate. Besides the regulatory challenges faced by SANParks and the government, this study reveals that local tour operators and guides also encounter challenges when applying regulations. In this context, all SANParks and NDT government officials highlighted that legislation and/or regulations to register as a local tour operator and guide are hindering the development of geotourism at the KNP. As participant TK, a SANParks official, asserted,

“Normally you will find that the whole issues of accreditation as tour guides, most of these communities have not gone through that process and they don’t know what it takes to be an accredited tour operator . . . ”

Even representatives of local community leaders and residents noted that SANParks and the government failed to comply with NEM: PAA in terms of community participation. This view that one of the challenges of geotourism is a lack of geotourism regulations and adherence thereof by SANParks and the government is in line with previous studies. Previous studies [27,31,32,96] also indicated the problems with relevant legislations and the management of geotourism. Therefore, SANParks and the government should comply with the existing legislation and introduce new regulations that focus on geotourism and the management of geoheritage sites.

5.8. Limitations

Due to the fact that the KNP is geographically very large, the focus of this study was only on the northern part of the park, especially around Pafuri Gate in Limpopo province. The scientific literature reveals a multitude of concepts and understandings concerning geotourism [10–13]. These studies mainly focused on geodiversity, geoconservation, geoheritage and geosites. However, these concepts have often been misused or confused [14,15]. To address this, the study by Ólafsdóttir and Tverijonaite [16] identifies a need for a larger body of empirical research focusing on (i) the sustainability of geotourism, including the actual impacts of geotourism on the geoheritage and the ecosystems of geotourism areas; (ii) knowledge of the effective management of the main challenges of geotourism, as well as (iii) on stakeholders and their complex interrelations, including the effects of geotourism on local communities and their well-being. Because geotourism is a new phenomenon with limited data, further research is needed to improve its understanding, especially in Africa [1]. Despite the rich geological history of South Africa, South Africa is still lagging in terms of geotourism research and the challenges involved [17,18].

Geotourism research is still new and few studies have looked at its geographical spread; hence, only three studies [11,21,22] were cited to provide a clear geographical picture of global geotourism research. Figures 1 and 2 highlight the lack of research on geotourism and its challenges, especially in Africa. Concerning this study, current knowledge of heritage resources within protected areas is extremely limited [25]. Furthermore, geotourism in South Africa has not been effectively developed and promoted by the NDT because of a lack of institutional and public participation in geology [27], lack of data on important geological or geomorphological sites [30], the conflation of geological with other ecological and cultural heritage issues [27] and problems with relevant legislation and management [29,31,32]. To address these issues, this study uniquely looks at a case study focusing specifically on the challenges of geotourism in the KNP and also recommends measures to address these challenges.

The study was qualitative in nature and relied on key informants with knowledge in the field. The study used a purposive sampling technique on the basis of the unique knowledge and/or understanding of the topic among key informants. The sample size was determined by the willingness and availability of the participants to take part in this research. Unfortunately, of the 17 anticipated interviews, one participant from SANParks

and one tour operator opted not to participate. Several attempts (sending e-mails and making telephone calls) to secure interviews with these participants proved fruitless, leaving 15 participants. The NDT government officials who participated suggested a third participant, giving a final total of 16 participants (Table 1).

6. Conclusions and Recommendations

This study demonstrates that little or no literature exists on the challenges of geotourism in South Africa, especially at the KNP. The findings show that the existing literature does not explore the challenges of geotourism development within an African and South African context. Generally, the literature does not describe the challenges of geotourism. Clearly, the literature review highlights the need for the development of research on the challenges of geotourism development. This study fills this gap by exploring the challenges of geotourism at the KNP.

The results of this study indicate that there are seven challenges in geotourism development, namely a lack of packaging and marketing; a lack of infrastructure; security and access to geoheritage sites by tourists; access to finance and markets; the destruction of geoheritage sites; social challenges; and regulatory challenges. It can be concluded that the challenges of geotourism at the KNP can result in negative perceptions of geotourism and can negatively impact the potential for geotourism to promote local development, especially for communities abutting the northern part of the KNP.

While this study focused on the challenges of geotourism at the KNP (local level), the implications of these findings contribute to the existing body of knowledge, the tourism sector and the protection of natural resources and employment generation at national (South Africa), regional (Africa) and international levels.

Given these potential challenges of geotourism, SANParks and the NDT government must implement the following:

- They should develop and implement geotourism products and marketing strategies.
- It is also vital to make sure that the times for visiting geoheritage sites are pre-determined and linked with the daily operational activities within the KNP to avoid any unnecessary confusions or delays.
- The NDT government and SANParks should provide access to geoheritage sites for tourists and local communities, including physically impaired people, as stipulated in the Tourism Act, 2014.
- The NDT government or SANParks should provide environmentally friendly infrastructure such as roads and toilets to make it easy to access geoheritage sites that are located in mountainous or rugged terrains. It is also important that the access road infrastructure considers physically disabled tourists.
- The NDT government should provide some financial support to SANParks to develop geotourism at the KNP. However, SANParks should also try to generate its funds to develop geotourism at the KNP.
- There is a need for the government or SANParks to improve access to finance and markets, especially for tourism SMMEs in the poor communities in the northern part of the KNP. In this context, SANParks or the government should ensure that all relevant information is made available to all role players in the tourism market, including local SMMEs.
- The NDT government and SANParks should provide education and awareness initiatives on geotourism.
- The NDT government and SANParks should consult and involve local communities in decision-making regarding tourism activities.
- The NDT government and SANParks must build an institutional human capacity to develop and support geotourism.
- The NDT government and SANParks should comply with the existing legislation and introduce new regulations that focus on geotourism and the management of geoheritage sites.

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