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Climate change and adaptation in the Zimbabwean nature-based tourism industry

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ABSTRACT

Weather and climate are vital for Nature-Based Tourism (NBT). Weather influences tourists' experience, while climate affects the timing of the season and attractions. This influence is particularly apparent in southern Africa, which has limited adaptive capacity to climate change. Particularly in Zimbabwe, the NBT industry is dependent on and affected by weather and climatic changes. It is important to investigate how the NBT industry in Zimbabwe is adapting to these changes. Through a qualitative approach, this study examines the adaptation strategies applied by NBT proprietors in four provinces around Zimbabwe, encompassing the major NBT destinations. The results reveal location-specific adaptation strategies. With the current and projected temperature increases and reduction in precipitation, there is a need for urgent adaptive action.

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Introduction

The effects of climate change uniquely affect different communities, individuals, organizations and countries based on their socio-economic, political, cultural and geographical differences (Becken et al., 2020; Saarinen et al., 2020, 2022). Climate change has emerged as a significant threat to the development and management of Nature-Based Tourism (NBT) over the past three decades (Hambira et al., 2021). This has resulted in a significant increase in global climate-related research on tourism destinations, with most studies emanating from the Global North (Scott and Gössling, 2015). The Global South has significantly higher vulnerability and lower adaptive capacity, particularly in the NBT industry, and thus requires more considered focus (Saarinen et al., 2022). Brouder and Lundmark (2012) highlight that climate change vulnerability is highly contextual, depending on the local climatic conditions, reliance on the tourism industry, and the type of tourism activity as important factors that define the overall vulnerability of a destination. It is, therefore, more challenging to manage climate change threats to tourism in countries such as Zimbabwe, which face pressing socio-economic challenges (Becken et al., 2020).

The NBT industry in Zimbabwe has been identified as one of the most vulnerable economic sectors in the country (Ministry of Tourism and Hospitality Industry, 2016). This is primarily due to significant dependence on the natural environment, which is threatened by climatic factors such as drought, rainfall variability, temperature increases, and tropical cyclones (Mushawemhuka et al., 2021). These climate-related threats are coupled with weak adaptive capacity and a highly volatile socio-economic and political environment (Dodman and Mitlin, 2015). The disparities in climate

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change threats are, in part, linked to a country's past and present socio-economic context, which weakens adaptive capacity (Saarinen et al., 2020). This study explores how the various tour operators in the four major NBT destinations around Zimbabwe address the climate change impacts faced in the country through adaptation strategies. Against this backdrop, this paper is divided into five sections. These sections will discuss contemporary literature on climate change, tourism and adaptation; the study area context and methodologies used; the qualitative results and analysis, a discussion of the main findings and lastly, a conclusion.

Tourism and climate change adaptation

Climate change adaptation, as defined by the Intergovernmental Panel on Climate Change (IPCC, 2021, p. 838), is "the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate and its effects . . . ". Adaptation not only reduces the impacts of climate change but also identifies opportunities that can ameliorate damages caused by climate change (Niang et al., 2014). Adaptation has evoked evolutions in technology through its transformation, restructuring, and adjustment of phenomena to conform to the new context created by climate change (Mihalic et al., 2021). It then occurs on a broad spectrum ranging from simple primitive measures, such as afforestation, reforestation and grass planting, to more complex and costly strategies, such as major structural infrastructure to withstand adverse weather and climatic elements (IPCC, 2021).

Furthermore, climate change adaptation aims to minimize the negative impacts, including identifying opportunities and taking advantage of them to derive possible positive environmental changes (IPCC, 2021). Within tourism, climate change adaptation involves stakeholders at all levels, including individuals, organizations, the public and private sector and communities (Kaján et al., 2015). The most common tourism climate change adaptation strategies include the diversification of products, changes in location, cloud seeding and air-conditioning (Scott et al., 2019).

Changes in weather and climatic conditions have affected the viability of numerous tourism activities worldwide. However, they have resulted in a shift in the perceptions held by tourists of these climatic conditions and the suitability of destinations for their vacations (Becken et al., 2020). This is an important aspect of the decision-making process involved in travel, including the selection of a destination, the timing of travel, and the type of tourism or activities (Serdeczny et al., 2017). The impacts of climate change on destinations have been identified by the United Nations World Tourism Organization (UNWTO, 2015) to affect operations, sustainability and competitiveness. Climate change alters climatic resources at destinations and has heightened the frequency and intensity of extreme climate events (Niang et al., 2014). This is evidenced by increased drought events, heat waves, tropical cyclone intensity, floods, strong winds, and erratic and spasmodic rainfall (IPCC, 2021). Sea levels have risen due to climate change, which has resulted in floods in some coastal environments (IPCC, 2021). These changes in weather and climatic conditions, directly and indirectly, affect the natural environment, damaging the aesthetics, resulting in loss of local biodiversity, increased coastal erosion, a decrease in wildlife, and damage to tourism infrastructure (Scott et al., 2019).

To ensure effective adaptation strategies, there is a need to identify the climate change impacts, and develop, prepare, respond and recover from these impacts (Jiricka-Pürrer et al., 2020). Scott et al. (2008) highlights five specific adaptation measures applicable to the tourism industry: research and education, policy; behavioural change; business management; and technical solutions. A range of processes that the tourism industry can implement has been identified by Hall and Higham (2005), which involve explicit and implicit adaptation strategies. Clear climate change adaptation strategies are aligned with climate change policies. In contrast, implicit climate change adaptation strategies do not relate to climate change policies but occur through implementing changes to address issues in sectors that share resources. In general, research on adaptation to climate change

in tourism focuses on how the sector aims to adapt to the climatic shifts through the transformations of operations (Hoogendoorn and Fitchett, 2018). Numerous studies focus on the efficacy of adaptation, implementation and attitudes of tourism stakeholders to climate change (Becken et al., 2020; Kaján et al., 2015; Mushawemhuka et al., 2021; Scott et al., 2019). Based on the perspective of the tourist destination stakeholders, climate change adaptation strategies should contribute towards developing a destination that is resilient to weather and climate-related stress and with the ability to recover and continue operating within a changing environment (Mihalic et al., 2021). Climate change adaptation has evolved to be imperative for tourism destination survival, as it enhances their strategies towards the transition to sustainable tourism (Baros & Dávid, 2007; Priego et al., 2015).

There is a growing body of research in southern Africa on the tourism industry, focusing on decision-making, perceptions and preference, which are pivotal in understanding how the industry is adapting to climate change (Dube and Nhamo, 2020). Focusing on tourism operations is crucial due to the contemporary business environment, driven by market forces of demand and consumption, which have limited regard for the environment (Hoogendoorn et al., 2021). Most tourism industry adaptation responsibilities have been decentralized to private proprietors (Hambira and Saarinen, 2015; Saarinen et al., 2022). In southern Africa, adaptation has primarily been decentralized to the community level, where communities have intentionally and unintentionally employed adaptation strategies as marketing and/or business survival strategies (Mushawemhuka et al., 2018). Hence, this focus on the lowest level of governance emphasizes the importance of investigating how stakeholders perceive, operate and adapt to the potential, existing and perceived impacts of climate change. Tourism stakeholders are increasingly conscious of and sensitive to climate change. In Zimbabwe, as in the case of Hwange National Park (Mushawemhuka et al., 2018), Victoria Falls (Dube & Nhamo, 2019) and Kariba (Dube & Nhamo, 2020), climate change is already being incorporated into planning and day-to-day operations. However, a significant number of tourism stakeholders still have limited knowledge about climate change and have thus been slow in the uptake of adaptation planning.

Methodology

This study was conducted in four provinces in Zimbabwe that are centres of NBT, namely Manicaland, Mashonaland West, Masvingo and Matabeleland (Figure 1). Manicaland covers the country's eastern plateau and the eastern highlands. This province is generally cooler than the rest of the country, with three main conservancy areas: Nyanga National Park, Chimanimani National Park and the Vumba Botanical Garden, which are all managed by the Zimbabwean government through the Zimbabwe Parks and Wildlife Management Authority (Child, 2014). The main tourist attractions in this province are the mountain ranges, and it has the largest water catchment area in the country (Ministry of Tourism and Hospitality Industry, 2016). Mashonaland West province hosts several tourist attractions such as Lake Kariba, Doma Safari Area, Mana Pools, Chewore Safari Area, Matusadonha National Park and the Chinhoyi Caves (Figure 1). This province's towns and growth points owe their development to tourism growth (Central Statistical Office, 2012). These attractions are located within the Zambezi catchment area, and it has major water bodies such as Lake Kariba. Most rivers have been dammed, which attracts tourists for fishing and sightseeing (Figure 1; Child, 2014).

Data collection and analysis

The participants for this study were selected through a purposive snowball sampling technique (Jones & Tanner, 2015). Snowball sampling was helpful in this research as the selected locations are predominantly tourist destinations, and the research was easily directed to proprietors through referrals within their respective communities. A total of 77 semi-structured interviews were conducted at selected tourist destinations in Matabeleland North

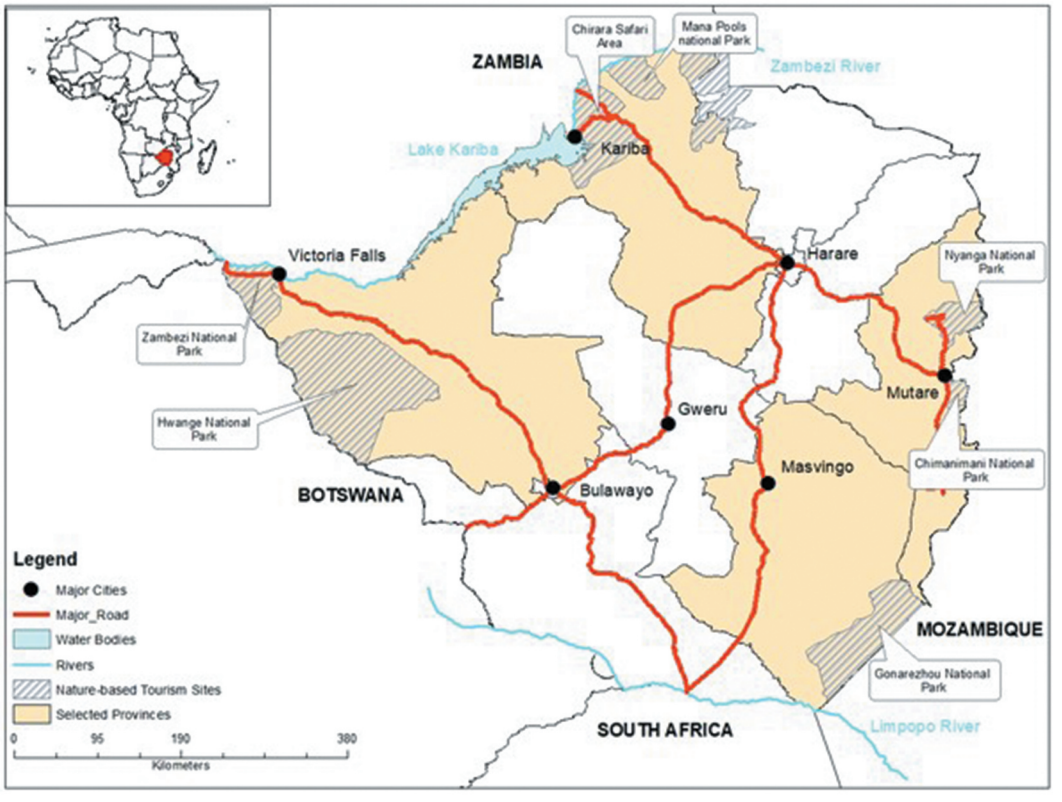


Figure 1. Study area map showing the four major NBT destinations in Zimbabwe.

(33 interviews in Victoria Falls; 12 interviews in Hwange National Park), Mashonaland West (12 interviews in Kariba), Manicaland (17 interviews in Rusape, Nyanga, Chipinge and Chimanimani) and Masvingo provinces (7 interviews in Gonarezhou National Park). The fieldwork was conducted from 1– 30 December 2019. Semi-structured in-depth face-to-face interviews were conducted at tourism accommodation establishments and with tour operators (Table 1). These participants were predominantly employees or owners of accommodation establishments and tourism tour operations (Table 1). From this sample, 32 were female, and 45 were male. Their ages ranged from 22–65 years, with the majority falling within the 25–40 year age group. Within this sample, 43 participants worked in lodges, 20 were in hotels, 12 operated in camps, and 12 were tourism tour operators. With the consent of the participants, interviews were recorded and transcribed while maintaining the anonymity of all participants. Where participants did not consent for the interview to be recorded, written notes were taken manually during the interview. The interviews were conducted in either English or Shona.

The interviews generally span 15–45 minutes. The semi-structured interviews were designed to capture the participant's perceptions and experiences of weather and climate, and how these have impacted their tourism businesses. The data from the interviews were transcribed and analysed using thematic analysis. This qualitative data analysis tool was used to identify, analyse and report themes or patterns derived from the data (Braun and Clarke, 2006). This data was coded and analysed, focusing on the area-specific environmental challenges faced by the tourism proprietors and their adaptation strategies (Kilungu et al., 2019). Tourism has been identified as more vulnerable to climate change impacts than other economic sectors (Hoogendoorn and Fitchett, 2018; Mushawemhuka et al., 2021). Therefore, this study sought to identify high-resolution climate-

Table 1. Tourism stakeholder participants interviewed across the selected locations around Zimbabwe.

Location	Stake Holder	Population	Role	Number of years working
Matebeleland North Province (Victoria Falls)	Hotels	8	(A) General Manager	5
			(B) Hotel Manager	4
			(C) General Manager	6
			(D) Front Desk Manager	9
			(E) Concierge	2
			(F) Hotel Manager	3
			(G) General Manager	10
			(H) Public Relations Manager	5
	Lodges and Bed & Breakfast	15	(A) Manager	3
			(B) Manager	4
			(C) Owner	7
			(D) Owner	10
			(E) Owner	12
			(F) General Manager	7
			(G) General Manager	3
			(H) Owner	6
			(I) Owner	5
			(J) Operations Manager	2
			(K) Manager	3
			(L) Manager	4
			(M) Manager	6
			(N) Manager	3
			(O) Manager	8
	Operators	10	(A) Boat Cruise Operator	5
			(B) Boat Cruise Owner	10
			(C) Boat Cruise Operator	8
			(D) Tour Guide	6
			(E) Tour Guide	5
			(F) Tour Guide	5
			(G) Flight Manager\Pilot	9
			(H) Bungee Jump Operator	8
			(I) Bungee Swing Operator	5
			(J) White Water Rafting Operator	11
Matebeleland North Province (Hwange National Park)	Hotel	4	(A) Manager	3
			(B) Manager	6
			(C) Manager	8
			(D) Front desk Manager	4
	Lodges and Bed & Breakfast	6	(A) Owner	9
			(B) Owner	10
			(C) Manager	5
			(D) Manager	12
			(E) Manager	3
			(F) Manager	6
	Camps	2	(A) Manager	4
			(B) Manager	6
Mashonaland West (Kariba)	Hotels	4	(A) Manager	3
			(B) Manager	6
			(C) Manager	8
			(D) Front desk Manager	4
	Lodges and Bed & Breakfast	6	(A) Owner	9
			(B) Owner	10
			(C) Manager	5
			(D) Manager	12
			(E) Manager	3
			(F) Manager	6
	Operators		(A) Boat Cruise Operator	5
			(B) Boat Cruise Manager	8

(*Continued*)

Table 1. (Continued).

Location	Stake Holder	Population	Role	Number of years working
Manicaland Province (Rusape, Nyanga, Chipinge and Chimanimani)	Hotels	6	(A) Manager	3
			(B) Manager	6
			(C) Manager	8
			(D) Manager Front desk Manager	4
	Lodges and Bed & Breakfast	10	(A) Owner	10
			(B) Owner	7
			(C) Owner	12
			(D) Owner	15
			(E) Manager	3
			(F) Manager	6
			(G) Manager	8
			(H) Manager	13
			(I) Manager	3
			(J) Manager	6
Masvingo Province (Gonarezhou)	Hotel	1	(A) Manager	7
	Lodges and Bed & Breakfast	6	(A) Owner	14
			(B) Manager	7
			(C) Manager	5
			(D) Manager	8
			(E) Manager	3
			(F) Manager	8

related impacts in the Zimbabwean NBT industry by focusing on the four major NBT destinations in the country.

Results

All the participants acknowledged that their business operations rely on the environment, particularly nature, since all of these selected locations are NBT destinations. Participants noted that their businesses would be non-existent without the NBT attractions around them, which was highlighted by the tour guide (D) in Victoria Falls: *"The whole town of Victoria Falls would not be what it is today if it was not for the existence of the waterfall"*. Similar sentiments were shared by boat operator (A) in Kariba, who noted that*"this town will probably be a very small border town if, it was not for the waterfall*".

In Victoria Falls, Pilot (G) felt that: "*We offer scenic views around the waterfall and the national parks as our primary tourism service, which is largely reliant on the environment"*. Similarly, lodge owner (A) in Gonarezhou echoed similar sentiments by mentioning that: " . . . *most of our business is centred on the national park hence we have created a strategic partnership with the park management . . ."* The accommodation establishments and tour operators were strategically located near the main tourist attraction in their respective locations, further highlighting their dependence on the environment. However, out of all the participants, only two tourism proprietors, who were lodge owners, provided different responses, noting that their businesses were "*partially related*" and "*not really related*" to their surrounding environment.

Adaptation

The participants in this study implemented various measures to adapt to the impacts of weather and extreme weather conditions experienced in their locations. Generally, adaptation is determined by factors such as the nature of the tourism product, the size of the operation, and the specific environmental context. Common to all the locations were various eco-friendly measures designed to improve tourist comfortability, curtail weather-related impacts and serve as marketing tools that were included in advertising their services. The standard practices include water and environmental

conservation and various energy-saving techniques. Accommodation establishments in and around Victoria Falls, Hwange National Park and Gonarezhou National Park are often affected by droughts and erratic rainfall; consequently, water conservation in these areas was a common adaptation strategy. All the establishments had water tanks that stored borehole water or rainwater to preserve the water supply.

Using energy-saving lighting, solar panels and cooking with liquid petroleum gas was common amongst the accommodation establishments at all the locations. This doubled as a business continuity strategy since the country generally experiences erratic water and power supply. Seven of the ten more recently constructed buildings had energy-saving designs that would use natural lighting during the day. Some of the older buildings were being renovated to allow more natural lighting, which reduces daytime electricity use and allows cooler air to circulate when temperatures are high. Since high temperatures are experienced at most locations, coupled with concerns of further temperature increases, particularly in Victoria Falls, Hwange National Park, Kariba and Gonarezhou National Park, most accommodation establishments have adapted by installing air-conditioning on their properties to control indoor temperatures. All the hotels and the larger lodges noted that all their rooms were fully air-conditioned. The hotel manager (H) in Victoria Falls stated that "*. . . temperatures here make tourists very uncomfortable, but we are privileged enough to have recently upgraded our air conditioning systems to commercial multi-split air-conditioners . . . .*"

The small to medium-sized lodges were either partially air-conditioned or had no air conditioning. The lodges that did not have air-conditioning relied heavily on other means of cooling their environments, such as thatched buildings, planting trees for shade, swimming pools, and constructing their establishments on the south-facing slope to receive less solar radiation. Planting trees and a diverse range of vegetation around accommodation establishments were common at all the destinations, mostly to provide shade and improve the aesthetics of the accommodation. In the semi-arid regions such as Victoria Falls, Hwange National Park and Gonarezhou National Park, xerophytic plants were dominant at accommodation establishments, as they require limited to no irrigation. The tour operators in Victoria Falls, Hwange National Park, Kariba and Gonarezhou National Park struggled to adapt to the high temperatures. The most common adaptation strategy for the summer temperatures was to provide game drives and boat cruises early in the morning and during sunset when temperatures were lower. Closed air-conditioned safari trucks were seldom used as they were too expensive and only available for an elite clientele. Boat cruise operators in Kariba had air-conditioned boats. However, they all noted that air-conditioning escalated their operation costs.

In summer, the tour operators along the Zambezi River and Kariba struggle to navigate their boats as the water levels are low during this season. Boat cruise manager (B) mentioned that:

> Though we can operate all year round, in the period between September, October and November, before water levels rise, we have to be very careful when navigating the dam because there is a risk of hitting on rocks and small islands. We also spend more money on fuel as this period requires more air-conditioning.

The tour operators in these areas highlighted that their navigation experience and prior knowledge of water bodies are vital to their operations during the summer season when water levels are low.

In Manicaland, the biggest concern was the destruction of property and infrastructure due to tropical cyclones and floods. The participants noted how the government and local authorities should be responsible for rehabilitating the infrastructural damage caused by extreme events. This seldom happens as the tourism proprietors, and local NGOs have been responsible for the repairs of roads and other infrastructure for their businesses. This was further highlighted by the lodge manager (J), who mentioned that" *. . . after the cyclone, we did not receive much help from the government, so we had to fix as much as we can by ourselves using primitive tools and with help from volunteers.*"

As an adaptation strategy, the participants noted that in the future, there is a need to renovate their properties with more robust building materials which can withstand the tropical. Unique to

Manicaland are the low temperatures experienced in Nyanga and Chimamani areas during the winter, which was noted to be a significant issue for tourists' comfort. As a means of adaptation, all establishments were equipped with various heating systems, where wood-fuelled fireplaces were standard because firewood is abundant in these areas. The more affluent accommodation establishments used central heating systems for their rooms, while the smaller establishments used liquid petroleum (LP) gas-powered fireplaces and electric and LP gas heaters.

All the tour operators noted a range of activities and services that could suit various income groups and the diverse climatic experiences in their areas. In Victoria Falls, Hwange National Park and Gonarezhou National Park, the tour operators are affected by high temperatures; as a result, they offer air-conditioned safari rides and boat cruises to the more affluent customers. However, when temperatures exceed thermal comfort levels, tour operators resort to offering their services at dusk and dawn to cater to low-income clients. Notably, even the helicopter flight services at Victoria Falls have air-conditioned and non-air-conditioned helicopters, which offer pricing to meet both the lower and higher-income groups.

Discussion

Globally, climate change has compelled all economic sectors to adapt based on their specific environmental contexts, adapting a critical process that addresses the challenges (Loehr and Becken, 2020). This has adopted a critical process that addresses the challenges presented by climate change (Hoogendoorn & Fitchett, 2018). In particular, the global tourism industry has had to employ various adaptation strategies as a reaction to the changes in climatic conditions. These include building or retrofitting infrastructure to withstand adverse weather, water conservation, off-peak season closure of businesses, early warning systems and insurance against extreme weather events (Dávid et al., 2012; UNWTO, 2015). This study highlights the various adaptation measures designed to address Zimbabwean NBT site-specific operations and the challenges faced in coping with the weather and climate-related impacts that threaten the tourism industry. The UNWTO (2015) noted that effective adaptation strategies are designed to cope with a specific destination's activities, natural environment and climate. This is the case in Zimbabwe, where the locations have varied adaptation strategies based on their specific spatial contexts. The socio-economic context, specific tourist attractions, and the regional changes in climate are unique to Zimbabwe.

This study reveals that the adaptation strategies are designed around the main attractions and the environment as opposed to urban tourism, which focuses more on physical infrastructure and tourist comfort (see Friedrich et al., 2020; Hoogendoorn et al., 2021; Saarinen et al., 2022). In Victoria Falls and Kariba, adaptation strategies are centred around Victoria Falls and Lake Kariba, respectively. In Hwange National Park and Gonarezhou National Park, adaptation is centred on facilitating game viewing, and Manicaland's adaptations are focused on the undulating terrain and flora in Nyanga and Chimanimani Mountain ranges. In Zimbabwean NBT, climate change has forced tourism proprietors in the selected locations to develop spatiotemporally specific adaptation strategies, many of which are comparable to other destinations with similar weather and climatic attributes.

This study revealed how some tourism proprietors have managed to cope with some of the current climatic elements and operate thriving businesses. They have implemented environmentally sustainable practices such as thatching, afforestation, reafforestation and eco-friendly establishments, which have all aided in reducing the impacts of adverse weather and climatic elements at destinations such as Victoria Falls, Hwange National Park, Kariba and Gonarezhou. The affluent hotels, lodges and some of the well-established tour operators resort to air-conditioning, which helps regulate high temperatures. Unfortunately, this is done at a high cost due to electric energy and fuel consumption, which has been viewed by the World Travel and Tourism Council (WTTC, 2015) as an unsustainable environmental practice carried out by the tourism industry (Dube & Nhamo, 2020).

Some of the adaptation strategies presented in this study were insufficient to cope with the current climatic challenges such as heatwaves, droughts and tropical cyclones; unlike other NBT tourism destinations in the global North with more significant capital investments and less severe impacts of climate change to date (Scott et al., 2019). The southern African climate change projections from the IPCC (2021) of a 1.0°C to 1.8°C increase under the very low Greenhouse Gas (GHG) emissions and a 2.1°C to 3.5°C increase under the current GHG emissions by 2100 will largely negatively impacts NBT in the region. Climate models for Zimbabwe project temperature increase more than 1.5 times the global average, accompanied by an increased rate and intensity of drought occurrences (Dodman & Mitlin, 2015). These projected climatic changes for the country will pose significant threats to the environmental and natural resources, which is a vital endowment of the NBT attractions offered by the country (Saarinen et al., 2022). Most of the adaptation strategies employed by the NBT tourism proprietors are likely insufficient to adapt to these temperature increases, except for air conditioning.

Given the temperature increase scenarios, there is increasing evidence highlighting how tropical cyclones are increasing in intensity and reducing in frequency as a result of climate change. In southern Africa, tropical cyclones are increasingly following a southward trajectory towards Mozambique, parts of Limpopo in South Africa and Manicaland in Zimbabwe (Pillay & Fitchett, 2019). This will likely pose more significant problems, particularly in Manicaland province, which is prone to tropical cyclones and does not have a solid adaptation strategy to adapt to this extreme event. The IPCC (2021) projections display a reduction in mean precipitation for southern Africa and an increase in excess evapotranspiration, which will impinge on the ecosystem functions crucial for NBT resources. These impacts are not as direct compared to extreme weather events such as tropical cyclones, which cause direct impacts (Saarinen et al., 2022). Again, the NBT industry at the selected locations does not have a long-term adaptation strategy to adapt to this reduction in precipitation.

This failure to ameliorate the extreme climatic elements experienced in Zimbabwe has resulted from limited scientific knowledge, access to technology and capital to effectively adapt to the current impacts and prepare for the projected changes. In most cases, effective adaptation strategies for Zimbabwe would require significant financial investments, such as road and bridge infrastructure that can withstand tropical cyclones and floods and the construction of more eco-friendly accommodation establishments (Njoroge et al., 2020). This is in comparison to developed countries which have managed to diversify their tourism and tourist product, which allows for the modification of infrastructure, policies and management practices of business models and, in turn, enhances the sustainability of the tourism resource (Scott et al., 2012; Mihalic et al., 2021).

Some climate change impacts, such as temperature increases and reduction in precipitation, are not effectively experienced in areas such as Manicaland, which are predominantly cooler and wetter than other NBT destinations. This gives off the false impression that climate change may not occur or may not affect these locations (Saarinen et al., 2020). Instead, the tourism proprietors in these areas focus on the more pressing operational issues affecting them daily than anticipate future impacts (Hoogendoorn & Fitchett, 2018; Mushawemhuka et al., 2018). Currently, the economic situation in the country has hampered most business operations, including the tourism industry. Therefore, if the current socio-economic and political context persists (Dube & Nhamo, 2020), tourism stakeholders in the country will continue to struggle with issues such as liquidity, which they are prioritizing over the implementation of climate change adaptation strategies. Furthermore, socio-economic and political factors are likely to limit adaptation measures. The unstable political environment, coupled with the harsh economic sanctions imposed on the country, has primarily limited investment, which is critical for implementing adaptation strategies (Mushawemhuka et al., 2018)

Conclusion and implications

The southern African region is projected to experience accelerating climate change impacts. Research on the region's experiences and responses by the NBT stakeholders is vital to the region,

as tourism is one of the core economic products for this region, specifically for Zimbabwe (Fitchett et al., 2017; Saarinen et al., 2022). This research applied a qualitative approach to investigating the impacts of weather, climatic changes, and adaptation strategies in Zimbabwe's major NBT destinations. This study presented the tourism proprietors' experiences of weather and climate in their environments and how their businesses strive to adapt.

The study found minimal concrete long-term adaptation strategies for the various impacts caused by the weather and climatic factors affecting the selected locations, such as the high temperatures experienced in Victoria Falls, Hwange National Park and Gonarezhou National Park, and the tropical cyclones experienced in Manicaland province. The results highlight that each location had relatively unique differences in tourist products, micro-climates and natural endowments. As a result, they essentially had different spatiotemporal adaptation strategies, mainly addressing the weather and climatic elements in their specific locations, which were primarily limited. The study illustrated the vulnerability of NBT to weather and climatic impacts and their limited ability to cope with the existing elements. This research further contributes to understanding the Zimbabwean NBT dimensions of climate change perceptions and adaptation strategies.

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