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ORIGINAL PAPER

Climate change impacts and risks: insights for tourism development in Victoria Falls, Zimbabwe

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Abstract

Concern over climate change impacts and risks on tourism spaces is increasing in the context of global south with limited adaptive capacities. This study examines the impact and risk of climate change phenomenon on tourism development in Victoria Falls. In-depth interviews with nineteen managerial employees purposively selected from Victoria Falls tourism stakeholders were employed. Thematically analysed findings identified the retreating of the iconic falls and drying of the rainforest as the most visible signs of climate change impacts, which posed significant risks on tourism development. Additionally, climate change-induced disruption of the 'normal' tourism business cycle coupled with shortened tourists' vacation time and reduced spending patterns significantly affected tourism operators' revenue margins. Furthermore, climate change affected the critical elements of tourism development namely image, brand, investment and goodwill; jeopardising the future prospects of tourism business. The study recommended inter-sectoral collaborations and addressing of climate change information asymmetry among stakeholders.

Keywords Climate change impact · Heritage site · Tourism dependent economy · Value chains · Tourism ecosystem · Stakeholders

Introduction

Climate change is a global issue with huge significance across different economic sectors. Topical issues, which are of global concern notably food security, industrialisation, investment in infrastructural facilities, reduction in carbon emission and overall socioeconomic wellbeing of global citizens are increasingly tied to climate change (Horne et al 2022; Matsa 2021; Virtanen et al. 2022). To this end, the impacts and risks posed to the global socioeconomic system by climate change are enormous. This is evidenced by heightened attention given to climate change by

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policy makers, politicians and development agencies. Over the past two decades, empirical studies on climate change have burgeoned in tandem with heightened interest associated with the subject in policy debates. Since the turn of the century, the frequency and sizes of high profile United Nations (UN) conferences on climate change increased tremendously. As Rowberry (2022) points out, since the turn of the millennium, weather-related disasters attributed to climate change have increased drastically. However, despite a surge in climate change induced negative impacts, a panacea to the climate change menace remains elusive. Tourism is one of the economic sectors vulnerable to climate change, natural disasters and epidemics (Lendolvo et al. 2020; Virtanen et al. 2022; Zhang et al. 2018). Apart from exacerbating the fragility of the tourism sector, climate change constrains its development and associated value chains. Walters et al. (2015) and Zhang et al. (2018) framed climate change as one of the main factor fuelling an unprecedented surge in the frequency and severity of natural disasters on the tourism ecosystem.

Climate change has emerged as one of the critical variables affecting tourism development, yet its impact and associated risks have not been fully encapsulated into the aspects of tourism development and planning, destination branding and product development. This is more conspicuous in developing countries, including Zimbabwe. Most governments have attempted to embed climate change impacts into strategic tourism development policy documents, however, as Fitchett et al. (2016) and van Staden (2021) reveal, the process is often very slow and disjointed. Furthermore, such processes are fraught with lack of coordination and also not informed by empirical data. To illustrate, a recent Zimbabwe National Tourism Recovery Growth Strategy (ZNTRGS) (2020) blue print jointly produced by the government of Zimbabwe (GoZ) and tourism stakeholders is silent about climate change aspects. This is so despite the apparent increasing threat posed by climate change on tourism development at Victoria Falls, one of the premier tourist destination. Similarly, the national development strategy one (NDS1), only acknowledges the importance of tourism towards achieving Vision 2030, and makes no reference to climate change as an existential threat to the tourism industry. This highlights glaring policy gaps. The future prospects of tourism development in tourist destinations vulnerable to climate change hinges on astute planning and recalibration of product development strategies informed by and grounded in the realities of climate change. However, given little emphasis associated with the impact of climate change on tourism development around world heritage tourism sites in the context of southern Africa, information relating to appropriate branding initiatives and product diversification remain limited. Horne et al. (2022) and Virtanen et al. (2022) outline that climate change linked phenomena like heat waves; drought and excessive rain have profound ramifications on the tourism system particularly on issues around infrastructure, seasonality of business and disruption of outdoor touristic excursions.

Although empirical research examining the impacts of climate change stressors on cultural heritage sites are increasing, few studies have examined climate change risk on natural heritage sites. A case in point is Sesana et al.'s (2021) study that analysed the impacts of climate change on built heritage sites encompassing monuments, archaeological sites, and historical buildings at global level. Similarly, Factoric and Seekamp (2017) examined climate change and cultural heritage. Daly

(2013) explored climate change impacts on archaeological sites while Dastgerdi et al. (2019) analysed climate change challenges to existing cultural heritage policies with limited studies of climate change on pristine natural heritage sites. Factoric and Seekamp (2017, p. 227) note that "…despite a high level of scholarly interest in climate change impacts on natural and socio-economic systems, a comprehensive understanding of the impacts of climate change on cultural heritage and resources across various continents and disciplines is noticeably absent from literature". In support, Sesana et al. (2021) stated that most climate change related studies accomplished to date are dominated by Western research given that Europe has been the main geographical focus. This highlights the under-representation of climate change studies originating from other regions.

The study aims to examine the visible impacts of climate change and their subsequent effect on tourism development in Victoria Falls. It also seeks to establish climate change induced risks on tourism development in Victoria Falls. Additionally, the study seeks to determine the specific touristic activities negatively affected by climate change risk and the implication on tourism development. Victoria Falls is an enclavic tourist resort, whose economy is wholly dependent on tourism. In essence, the study addresses two vital questions. Firstly, what are the impacts of climate change on tourism development in Victoria Falls? Secondly, what are the risks of climate change on destination Victoria Falls brand? The study holds relevance for the Victoria Falls tourism industry stakeholders and decision makers in light of the initiatives being put in place aimed at reviving the tourism sector notably the re-engagement initiative. Victoria Falls is at the centre and unique selling point of destination Zimbabwe. While tourism sector stakeholders are scaling up efforts to restore the key source markets and boost tourism, with Victoria Falls as a star attraction, the tourist resort has been imperilled by climate change and risk issues (Mushawemhuka et al. 2021), making an examination of climate change impact and risks on tourism development a timely topic. The current study contributes to the evolving climate change-tourism discourse with reference to tourism development in Victoria Falls. It amplifies on tourism development elements such as level of investment, branding, capacity utilisation and expansion prospects, product development and revenue margins which have not been given emphasis in previous researches. In essence, for a very long time these aspects have been predominantly informed by other factors excluding climate change.

This research proceeds in five parts. The first part is the introduction. The next section reviews climate change-tourism nexus literature. Then, the next section presents the study area and the methods applied. After this, the findings are presented and discussed. The study conclusion and implications section is provided afterwards.

Literature review

Overview of tourism sector in Zimbabwe

Tourism development in Zimbabwe as measured by tourist arrivals maintained an upward trajectory between 1980 and 1990 increasing to a peak of 2.5 million

Covid-19 aside (Zhou 2018a; ZTA 2018). Tourism is the fastest-growing service industry worldwide, and is a key pillar of the Zimbabwean economy (Zhou 2019; Zhou and Nyahunzvi 2022). The sector is so significant to the Zimbabwean economy as it is ranked on third position, after agriculture and mining, in terms of job creation, foreign currency generative capacity and infrastructural development (Matiza and Perks 2021; Zhou and Chibaya 2022). In 2019 it contributed hugely on the gross domestic product front (GDP), which was 15%, earned $1.4 billion in revenue and employed nearly 300,000 people directly (ZTA 2019; Zhou 2018b). The tourism sector is supported by an expansive flora and fauna resource base namely Hwange national park, Gonarezhou national park, Great Zimbabwe monuments, the Eastern Highlands, and the majestic Victoria Falls as prime tourist attractions (Zhou 2017; Zhou and Chibaya 2022). In Zimbabwean tourism parlance, Victoria Falls is deemed as the Mecca of Zimbabwe's tourism industry. It is popular with the global tourism market on the strength of its combination of the finest rainforest, recognised United Nations Education and Scientific Organisation (UNESCO) world heritage site label, abundant wildlife, and improved connectivity attributed to the refurbished Victoria Falls International airport. Despite the abundance of such a huge base of tourist attractions, the tourism industry in Zimbabwe experienced its worst performance in the 1990s. The GoZ's land redistribution programme, recurrent contested election outcomes, unstable macroeconomic environment, and poor market perception (Mkono 2012; Zhou and Nyahunzvi 2022) were some of the setbacks, which caused capacity utilisation to drop to unsustainable levels. In addition, Zimbabwe also experienced episodes of extreme weather patterns ranging from recurrent droughts, for example, the 1991 drought; cyclone induced floods, for instance, cyclones Elline in February 2000, cyclone Dineo in February 2017 and Idai in March 2019. These triggered forced displacement, destruction of livelihood, and damage of infrastructure, which is critical to the tourism sector. Against this backdrop, the GoZ deployed a number of strategies to revive the tourism sector namely perception management programmes (Zhou 2014), and re-engagement with the international community.

Climate change and tourism nexus: a global perspective

A set of variables namely industrialisation, expansion of agrarian activities, global health emergencies, and climate change continue to affect the tourism industry worldwide. Such phenomena have had varied impacts on the tourism industry at global, regional and local scales. Gossling et al. (2020) identified climate change as one of the most significant factor influencing tourism development. This buttresses the views of Bertolin (2019) and the United Nations World Tourism Organisation (2007) (UNWTO) who posit that climate change is the greatest threat to sustainable tourism development in the twenty-first century. As Bertolin (2019) points out, climate change is associated with extreme high temperatures; which trigger heat waves, drought and excessive rainfall. Subsequently, this causes flooding and destruction of key infrastructural facilities. Hamzah et al. (2012) outline that extreme weather and climatic events have a direct impact on tourism, affecting natural and built tourist attractions like ecosites, beaches, resorts and outdoor activities. As an illustration,

infrastructure is a key tourism artery, drought affects vegetation and wildlife biodiversity and other water-based tourism activities. While tourism is widely acknowledged as a key agent of socio-economic transformation (Zhou 2022), it is hypersensitive to crises, (Musavengane and Zhou 2021), more so to climatic dynamics.

According to the World Travel and Tourism Council (WTTC) (2020) tourism contributes positively to the socio-economic development of countries. At sub-regional level, Gowreesunkar (2019) notes that the African Union's Agenda 2063 view tourism as an engine for the socio-economic development of Africa. However, climate change induced risks and challenges pose a serious threat to the sustainability of nature and disrupt socio-economic systems. Hernandez and Ryan (2011) maintain that the impacts of extreme weather and climate related phenomena like floods, droughts, storms, and high temperatures pose significant threats to the tourism industry at micro level affecting the local economies.

Hoogendoorn and Fitchett (2018), the Intergovernmental Panel on Climate Change (IPCC) (2014) and Niang et al. (2014) note that African countries are vulnerable to climate change because of their comparatively lower adaptive capacity. Consequently, Sercheczny et al. (2017) painted a grim picture by predicting increases in extreme heat, flooding, and reduced rainfall occurrences in sub-Saharan Africa. This threatens tourism development, and disrupt the tourism system through destruction of key tourism infrastructural facilities and changes in tourist mobility patterns. This is a concerning issue given that sub-Saharan African countries including Zimbabwe are highly dependent on tourism as a key sector for economic development (Zhou 2022). The situation is further exacerbated by what van Staden (2021) and Fitchett et al. (2016) ascribe as lack of urgency and non-prioritisation of climate change by developing countries. In addition, very weak governance systems coupled with extremely ineffective institutions characterising African countries makes climate change a peripheral issue in most tourism development policies. This implies that tourism governance suffers, especially in the context where African governments have an obligation to ensure that communities reap optimal benefits from tourism resources. However, with the right strategy and timely policy intervention there is still hope for tourism development for tourist destinations vulnerable to climate change. The climate change theme has been extensively examined in different geographical contexts (Gudoshava et al. 2020; Sesana et al. 2021). However, a close analyses of extant literature show that past studies on the impact of climate change predominantly focused on economic sectors such as agriculture, health, and wildlife tourism segment. Overall, the extent of knowledge thus mostly remains in the form of health and coping strategies literature. Tourism and hospitality related studies in southern Africa in general and Zimbabwe in particular are only starting to emerge (Hambira and Mbaiwa 2021; Saarinen et al. 2020). There is a growing stream of tourism research output in Africa in general and southern Africa in particular in recent years related to the climate change-tourism theme, for example, van Staden (2021), Gudoshava et al. (2020), Hoogendoorn and Fitchett (2018), Sercheczny et al. (2017), Kobert et al. (2016), Asiyambi (2015). Although some scholars notably Fitchett et al. (2016) and Hambira et al. (2013) recognise Africa as highly vulnerable to climate change and bear the brunt of climate change impacts globally, other scholars namely Hoogendoorn and Fitchett (2018), Rogerson (2016) and Sesana

et al. (2021) point out that there is comparatively a dearth of research on climate change impact on local tourism industry at micro level. Additionally, information relating to how climate change impacts and risks affect other elements tied to tourism development like destination branding, investment, and tourism product diversification in the context of developing countries remain scant. To this end, Donkor et al. (2019) posit that the International Panel on Climate Change (IPCC) reports have consistently highlighted the vulnerability and significant diversity of the tourism sector, pointing to a need for further research on climate change adaptation.

Broadly, research on climate change and heritage sites largely remain skewed in favour of western countries, more so focusing on cultural heritage sites in the built environments, see, Sesana et al. (2021), Factoric and Seekamp (2017), and Rowberry (2022). These studies concluded that climate change is a threat to the coastal built heritage. However, it is noteworthy to highlight that the findings have limited application as they cannot be generalised to fit into the context of tourism development processes in developing countries. For example, Rowberry (2022) focused on challenges facing heritage law frameworks in the most developed countries namely the United States, United Kingdom and France. These countries are arguably better equipped with climate change responsive mechanisms and resources unlike their developing countries counter parts (Hoogendoorn and Fitchett 2018). This suggest a need for similar researches in the global south context, which incorporate the perspectives of the developing world's experiences of climate change impact and risks on tourism development to the burgeoning global tourism-climate change discourse. This is predicated on Jurgilevich et al. (2017)'s premise that the dynamics of climate change and risks remain diverse. Such studies would also address what Sesana et al. (2021) pointed out as the disproportionate underrepresentation of the global south's localised impacts of climate change in the global climate change discourse.

Most studies on the climate change-tourism theme broadly focused on risk of flooding and subsequent impacts on the accommodation sector and related costs to the tourism sector at macro level (Bernard and Cook 2015; Fitchett et al. 2016; Hamzah et al. 2012; Vilan et al. 2019). As Hambira et al. (2013), Hernandez and Ryan (2011), Hoogendoorn and Fitchett (2018), Niang et al. (2014) point out, tourist destinations' vulnerability to climate change, adaptation and coping strategies have also had extensive coverage. Similarly, climate change models, change in tourism demand and tourist consumer behaviour induced by climate change have been equally given considerable page space (Gossling et al. 2012; Kobert et al. 2016; Rosello and Waqas 2015). However, a close analysis of the above outlined studies reveals that none seem to have examined the impacts and risks of climate change on tourism development within the prism of a pristine world heritage site, particularly in the context of a perceived alteration and disappearance of key features of a natural tourist attraction. Donkor and Mearns (2021) posit that the nexus of climate change and tourism is an intricate interrelationship that is largely site-specific. Consequently, the present study is significant against a backdrop of a media narrative painting a micro-environment at Victoria Falls that does not seem to provide a promising setting for further development of the tourism sector (Mushawemhuka et al. 2021). Victoria Falls has a loft significance as a mega tourist attraction nationally and regionally. Empirical studies on tourism in Victoria Falls have focused on

risks posed to the resort town's tourism sector by vendors (Zhou 2017); tourist satisfaction with the rainforest (Zhou 2018b); cross-border destination marketing (Woyo and Slabbert 2019). It is important to highlight the fact that these studies remain remotely connected to climate change, which is a limitation. The current research further acknowledges the few studies, which examined the different climate change subthemes and the tourism sector in Victoria Falls. For example, greenhouse gas emissions theme (Dube and Nhamo 2021); tourism business operators' perceptions; and climate change variability and potential impacts on tourism (Dube and Nhamo 2018). However, it is worth mentioning that the studies paid little attention to the tourism development theme, which is a huge limitation. To add on, the various climate change subthemes were explored in isolation of the overall tourism sector development aspect, yet empirical evidence suggests that integrated approaches are most suited to address climate change impacts (Matsa 2021; Donkor and Mearns 2021).

Gossling et al. (2012) assert that an area's climatic conditions are a core factor underlining its appeal as a tourist destination. Similarly, Hoogendoorn and Fitchett (2018) and Scott et al. (2012) further argue that climate is both a tourism attraction and a tourism enabler. Climate shapes tourist travel motivation, determines when and where tourists travel and how tourism interactions are experienced. Rosello and Waqas (2015) strengthen this viewpoint by stating that climate change affects the comparative allure and competitivity of tourist destinations, which ultimately impact tourism development processes. Hoogendoorn and Fitchett (2018) outlined that climate change impacts are already evident in the tourism industry and arguably informs policy formulation. Becken and Wilson (2013) posit that an increase in the severity of natural hazards induced by climate change makes it critical to understand the interplay between climate change and the tourism industry in order to apply adaptive measures that effectively mitigate the harmful impacts. In the context of the present study, Victoria Falls as a tourist destination is particularly vulnerable to climate change since it is characterised by a high number of outdoor tourism activities, attractions and nature-based adventure tourism, features which are highly prone to climate change. Donkor and Mearns (2021, p. 168) state that the "complex interaction between climate change and the tourism sector makes it imperative to involve key stakeholders in a holistic approach to effectively address the challenges".

Study context and methods

Victoria Falls

The study examines the impacts and risks of climate change on tourism development in Victoria Falls. Victoria Falls is endowed with a critical mass of outdoor tourism activities, ranging from rainforest, flora and fauna to white water rafting in the mighty Zambezi River and Hwange national park (ZTA 2018). It was granted a world heritage tourist site status by UNESCO in 1989. Recently, there has been growing concern on tourism following a media scare that the adverse effects of climate change were taking a huge toll heightening concern over tourism development

in Victoria Falls (Mushawemhuka et al. 2021). Victoria Falls is located in the western part of Zimbabwe in Matabeleland north province (Fig. 1). Matabeleland north province is semi-arid and extremely hot. Malaria and tsetse flies are prevalent in the region posing healthy risks to tourists (Zhou 2017). Victoria Falls is a popular destination with regional and international tourists (Zhou 2018b; Woyo 2021). It has several world class tourist attractions ranging from the renowned world heritage site, the falls, rainforest, Hwange and Victoria Falls national parks both teeming with the big five, and bunji jumping (ZNTGS 2020). It has a variety of tourism accommodation facilities encompassing African Sun, Rainbow Tourism Group (RTG), Cresta-Hospitality, Albida Africa, guest houses, chalets, and camp sites (Zhou 2016). There are several tour operators, travel agencies, car rental companies, restaurants and destination management organisations which provide a broad range of tourism related services to tourists. The economy of Victoria Falls town is largely dependent on

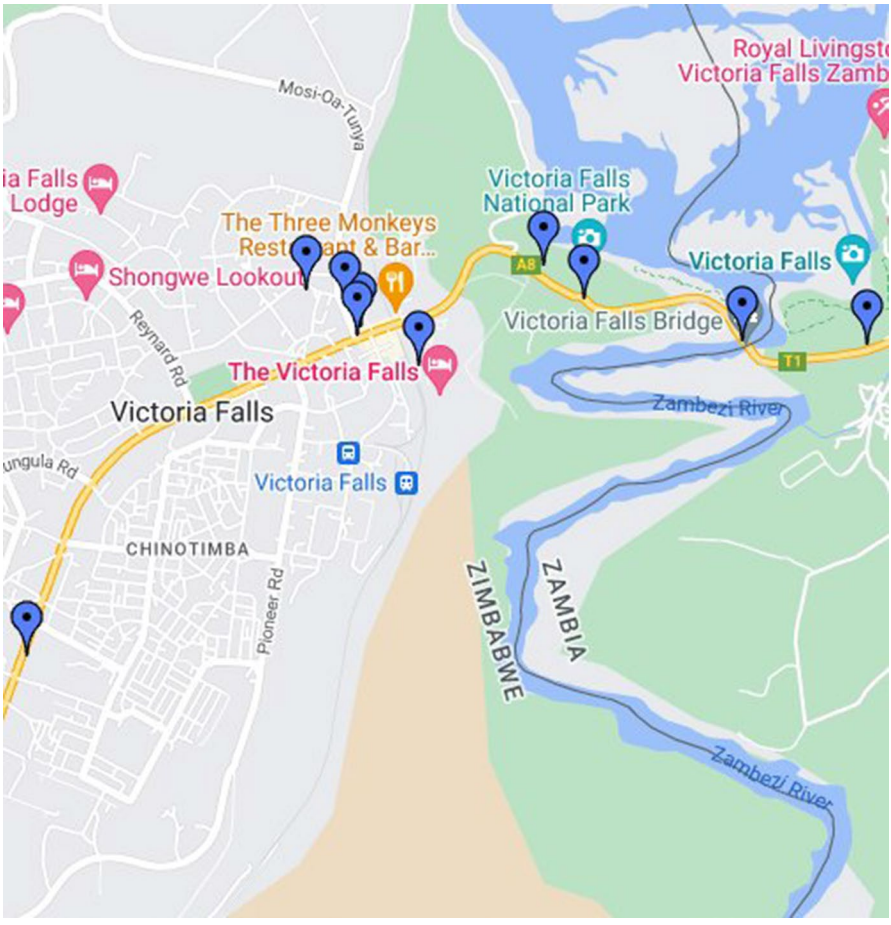

Fig. 1 Victoria Falls map

tourism. However, climate change is emerging as a threat to tourism business in Victoria Falls. The problem is further exacerbated by the fact that Victoria Falls' tourism industry is anchored Insert Victoria Falls map here Fig. 1.

On physical tourist attractions vulnerable to climate change.

Methodology

A qualitative research approach was utilised whereby a key informant semi-structured interview technique was employed (Maguire and Delahunt 2017). The study investigates an evolving phenomenon, which presents a novel situation where little is known about it. Cognisant of the diverse perspectives of the respondents, the study adopted Clarke and Braun (2013) framework. Data were collected using on line interviews with tourism sector managerial employees between October and November 2021. On line interviews resonated with the then prevailing Covid-19 pandemic induced restrictions, therefore increasingly becoming a common method of data collection (Woyo 2021). Zoom video conferencing platform was employed to conduct the online interviews. Interview questions were formulated based on the review of literature on climate change and its impacts on tourism, and aim of the study.

Thirty participants were approached using institutional email addresses, where the objectives of the study were explained. Nineteen participants consented to participate, representing a 63.3% response rate. Nineteen participants were regarded as adequate on the basis that previous tourism studies have been conducted using samples between 14 and 30 participants, and were deemed sufficient for scientific analysis in qualitative research (Phelan 2015; Yap and Ineson 2009). One inclusion criterion was that participants were supposed to have been operating a tourism related business for the past 10 years in Victoria Falls in order to participate in the study.

The study participants were then selected using a purposive sampling strategy. Participants were drawn from the different tourism subsectors guided by the data base of registered tourism stakeholders in Victoria Falls obtained from the Zimbabwe Tourism Authority Victoria Falls regional office. Table 1 summarises the participants' demographic profiles. Participants were invited for the interviews through their institutional email addresses and they were apprised of the consent and right to anonymity. Interview sessions averaged 25 min, and were recorded using the zoom cloud facility. Interviews were conducted, transcribed and analysed using thematic analysis. Thematic analysis is a good approach in qualitative studies as it allows to discern participants' views and opinions from a set of data such as interview transcripts. Careful observation and analysis of subthemes resulted in five dominant themes labelled.

Data analysis

The study employed a thematic content analysis as guided by Clarke and Braun (2013) to interpret data. Key themes which emanated from the data were weaved into similar paragraphs by way of meaning condensation. According to Creswell (2013) meaning

Table 1 Summary of participants' demographic information. *Source* Author

Participant	Subsector/organisation	Designation	Gender	Age	Experience (years)
1	Hotel	General manager	F	45	20
2	Lodge	Sales and marketing executive	M	38	10
3	Chalets	Housekeeper	M	40	15
4	Campsite	Campsite manager	M	41	17
5	National park	Area manager	F	50	25
6	Tour operator	Tours manager	F	35	12
7	Travel agency	Travel consultant	M	30	10
8	Boat cruises	Manager	M	39	11
9	Convention	Events coordinator	M	46	16
10	Airline	Sales consultant	F	37	12
11	NTO	Regional manager	F	49	20
12	Safaris	Manager	M	51	26
13	Restaurant	Operations manager	F	40	16
14	Publicity Association	Secretary	M	42	16
15	Curio	Sculptor/vendor	M	56	19
16	Car rental	Fleet manager	M	54	23
17	Private conservancy	Environmental officer	F	38	18
18	Guest house	Manager	F	55	26
19	House boat	Manager	M	51	24

condensation entails summarising the repetitive themes into terse formulas. The meaning condensation process unfolded as follows: evaluation of the selected text in order to have an informed comprehensive overview; recognition of the meaning units; paraphrasing core thematic areas in line with meaning units; cross evaluation of meaning units; and merging of the critical core themes of the text into a descriptive statement. Microsoft excel was used in tabulating the themes (Bree and Gallagher 2016). This was followed by the collation and classification of the impacts and risks into four main themes.

Findings and discussion

This section presents findings in themes. Four main themes emerged and are discussed below.

Visible climate change impacts and associated risks to tourism development

Field data showed that there were several visible impacts attributed to climate change on tourism development in Victoria Falls as illustrated by participants' responses:

> The intensity of the spray mist has changed, and in some instances it disappeared, the iconic falls are retreating, and flow of water has been significantly reduced, yet these are the signature tourist attractions in Victoria Falls. [Tours manager, Participant 6].
> Several tourist facilities based on water activities have scaled down and some have ceased operations due to the depleted water levels. Most customers cancelled their bookings because of the unavailability of regular tourist activities, particularly non availability of wildlife during certain times of the day. [NTO Regional manager, Participant 11].

Participants claimed that there were perception risks associated with the visible impacts. The ensuing extracted excerpts are instructive:

> Tourism and hospitality operators witnessed a sustained increase in negative word of mouth (WOM) publicity, coupled with a sharp decrease in tourist numbers, and depressed sales. This has weakened market confidence and triggered job losses in the sector. One of our business partner pulled out citing uncertainty, which undermines tourism development. [Houseboat manager, Participant 19].
> Climate change experts are pessimistic, warning further that the impacts and associated risks of climate change on tourism development could worsen in future. This hurts further tourism investment in Victoria Falls. [Hotel General manager, Participant 1].
> There was a huge drop in capacity utilisation across tourism facilities when the media reported about the retreating falls and drying up of the rainforest. Overseas potential tourists who had made reservations were unsettled resulting in most of them cancelling the trips. [Victoria Falls Publicity Association secretary, Participant 14].
> Climate change is destroying the key pillars of Victoria Falls' tourism industry. [Safaris manager, Participant 12].

The climate change induced impacts and risks emanated from erratic rainfall patterns. Before the climate change phenomenon, the Zimbabwean side was popular for providing a better view of the falls. However, due to climate change dynamics, the Zimbabwean side's comparative advantage to Zambia was hugely weakened. Climate change is affecting both the Zimbabwean and Zambian side of the iconic tourist attraction; however, the media gives an impression that it is only the Zimbabwean side that is affected. It is concerning that climate change menace is unfolding at a time when the tourism sector is scaling efforts to recover from a decade long political and economic challenges which almost brought the tourism sector to a near collapse (Zhou 2014; Mkono 2012). Climate change impacts

affect the core features of the tourist attraction, namely, the falls, rainforest, and spray mist. On the basis of the destination amalgam concept, these constitute the bedrock of tourism development. Tourism development is tied to the availability of wholesome tourist attractions. Most tourism businesses ranging from accommodation to outdoor tourist activities revolve around the features of tourist attractions that have been badly affected by climate change. Similarly, inbound tourists to Victoria Falls are largely motivated by the features perceived to be decimated by climate change.

The findings are in line with Yaukson et al. (2017) who stated that climate change can inflict physical damage on features of a tourist attraction. It is apparent that erratic rainfall impairs the natural appeal of the rainforest. Interestingly, the two features of the world heritage site have visibly lost their allure. The unenviable reputation of 'retreating falls' and badly affected rainforest have become a huge deterrent to potential inbound international tourists to Victoria Falls. The falls and rainforest are principally the traditional draw cards of inbound tourism traffic to the iconic world heritage site. This corroborates what Hoogendoorn and Fitchett (2018) established that tourism development depends on the overall functioning and integrity of the tourism ecosystem. Henceforth the overall 'demise' of the iconic features of the heritage site has far reaching repercussions on tourism development (Mushawemhuka et al. 2021). Ultimately, the climate change-induced decline in tourism business at Victoria Falls would have knock on effects on other economic sectors, like airlines, travel insurance, fuel and curio trading, retail, as well as financial services particularly bureau de changes. As mentioned in the literature, the economy of Victoria Falls is entirely dependent on tourism. In addition, the decline of tourism business in Victoria Falls would also badly affect Zimbabwe's economic growth prospects, which are underpinned by the tourism sector, framed as a low hanging fruit.

Disruption of the 'normal' tourism business cycle and product development

A common view amongst interviewees was that climate change impacts and risks on tourism development at Victoria Falls manifested through the delay in the opening of key tourist facilities. The following excerpts illustrate this:

> We shifted the opening dates of the rainforest two times, and eventually we opened 3-weeks behind our traditional opening schedule. Similarly, the opening of Victoria Falls national park gates to tourists was delayed by almost a month. The famous sunset cruises were completely cancelled given the depleted water levels, and visitors were unhappy. [Parks regional manager, Participant 5].
>
> Game drives and white water rafting excursions were delayed. [Safaris manager, Participant 12].
>
> At some point we got to a situation where as an organisation we had no option except to completely remove from our product catalogue popular touristic activities like elephant rides, flight of angels, horse riding, wild animal trekking, bird watching; bush dinners among others as a result of climate change induced elements at Victoria Falls. [Safaris manager, Participant 12].

This finding has important implication for Victoria Falls tourism operators. It implies reduced vacation time for tourists on holiday. Customers with advance bookings were greatly affected. This also undermined goodwill and trust between customers and tourism service providers. Customer goodwill and loyalty spur tourism development. Tourism development is greatly affected by mutual relationships built on trust and therefore perception is paramount. This points to a need for an effective communication strategy between tourism service providers and customers. Collaboration between intermediaries, markets and within the tourism value chain and other sectors of the economy would go a long way to manage perception issues and restore goodwill. The changes in the opening season of the rain forest had unintended consequences on tourism development ranging from reduced tourist expenditure, compromised value for money and unavailability of some of the popular tourist activities. Climate change impacts have thus caused the demise of tourism offerings, rendering some tourism products obsolete, hence making it imperative to adopt a different business approach coupled with an effective communication strategy. The following excerpts illustrate this:

> There is an urgent need for service providers to re-align current tourism product offerings to reflect climate change dynamics. Climate change is forcing us to take off some products from the catalogues thereby trimming the range of products. [Private conservancy environmental officer, Participant 17]
> Tour operators need to properly advise tourists of significant changes on products on offer and effectively manage market perceptions. This calls for innovation through product development and introducing new products which could fill up the gap created by products which are no longer on offer due to climate change. [Car rental fleet manager, Participant 16]
> There is a need to focus on new tourist sites other than Victoria Falls. It is also prudent to offer discounts, or run promotions to entice tourists. [Travel consultant, Participant 7].
> Climate change has caused some of the products to become obsolete, for example, the rainforest's spray mist is becoming extinct, watching of wild animals like elephants, and birds in their natural settings is increasingly becoming difficult. This has been necessitated by the migration patterns of wildlife that have changed in response to climate change. [Parks area manager, Participant 5].

Product innovation is closely related to the interruption of the normal tourism business cycle. Therefore, Victoria Falls as a tourist destination and its tourism product offering can be rejuvenated in line with Butler's tourist area life cycle model (1980). Climate change is a significant phenomenon that triggered fundamental changes on Victoria Falls tourism development matrix. The findings are in agreement with Hoogendoorn and Fitchett (2018) who found that the presence of wildlife species provides a fulfilling encounter with nature resulting in a satisfying experience of outdoor safaris. This is especially significant in the context of international tourists from overseas markets, who mainly visit Victoria Falls motivated by the fascinating encounters with wildlife in their natural settings. However, because of climate change, the presence of such wildlife is diminishing in line with changing patterns

of wildlife movement. Firstly, vegetation that provides natural cover is depleted due to poor rain. Consequently, wild animals are forced to drift deeper into the national park where they become invisible and hardly accessible by tourists unlike before. Secondly, climate change-induced drought is seriously threatening the biodiversity therefore putting wildlife survival at stake. These findings are consistent with what was found by Gudoshava et al. (2020) and Carlson et al. (2020) that climate change affects the distribution and availability of wildlife as they come into closer contact with humans. Provision of a fulfilling tourism experience is impossible in the absence of an interface with wildlife in their natural habitat. Similarly, the findings support the view of Winter and Broom (2018) who opined that tourism to a greater extent depends on the natural ecosystem where it takes place. Therefore, tourists react to the vagaries of climate change in their immediate environments by either shortening their vacation period or substituting the tourist destination, which would ultimately constrain tourism development at the destination level. The shrinking base of touristic activities due to climate change risk apparently implies that a holiday visit to Victoria Falls becomes an unworthy while investment on the part of tourists, further shrinking the tourism service providers' bottom line.

The most interesting finding was the pricing of the tourism product, which participants felt it needed attention given that climate change had affected both the length of tourists' vacation period, and their spending patterns. A campsite manager, participant 4, had this to say:

> The average stay period at our campsite has decreased from an average of 6 days to about three days after climate change challenges. This has affected our sales forecasts and revenue projections by half. Through exit interviews customers indicated that they cut short their usual stay period because some of the activities which they used to engage in are no longer offered.

The climate change induced closure of tourism facilities, coupled with cancellation of bookings create uncertainty which undermines tourism development through negative market sentiments. The prospects of causing a permanent damage to the reputation of Victoria Falls as a tourist destination are huge. Similarly, the unavailability of certain tourism product offerings becomes a source of discomfort to prospective customers, development partners and investors thus hurting tourism development. Such an uncertain environment would naturally force prospective investors to either put on hold any capacity expansion programmes, or stop investing in new product lines, hence holding back tourism development in terms of the addition of new facilities.

The above findings are in consonance with Rajendra (2020) who found that climate change causes cancellation of pre-planned itineraries and closure of tourism facilities. Prior to the climate change issue, Victoria Falls was known for offering a wide range of tourism activities, however, this is being threatened by climate change. Participants were concerned that extreme elements induced by climate change caused numerous tourism facilities including the rainforest to close or having their opening dates shifted. The findings are also in synch with other climate change induced impacts on some tourist destinations like the Okavango Delta, Botswana where Hambira et al. (2013) established massive cancellation of boat and sunset

cruises as a result of extreme weather patterns. Overall climate change induced day temperatures are increasingly becoming too hot for sight-seeing, with temperatures interfering with wildlife migration patterns and breeding, hence compromising tourism activities at Victoria Falls. Consequently, it becomes apparent that Victoria Falls' expansive base of tourist activities like curio markets, tours, white water rafting, elephant rides, bunji jumping, bird watching, hotels, eateries, convention spaces, wildlife water hole sites, casinos, leisure and entertainment spaces, which collectively make the resort town a citadel of tourism are at risk of being eclipsed by climate change. At Victoria Falls, sunset cruises and white water rafting have been cancelled due to very low water levels in the Zambezi river. Such touristic activities are critical revenue streams for local tourism operators; hence their cancellations negatively impacted tourists' spending patterns and subsequently revenue inflows.

Elements of tourism development affected by climate change

Participants expressed a variety of perspectives on this aspect highlighting various elements of tourism development affected by climate change at Victoria Falls. This is summed up by the ensuing excerpts:

> Climate change has affected the image of Victoria Falls; the market is now sceptical about the brand…in light of the vulnerability of the core product. [Houseboat manager, Participant 19].
> We have lost goodwill on future investment in the tourism sector because of climate change issues. [Car rental fleet manager, Participant 16].
> Progress to restore the overseas tourist market to spur tourism business at Victoria Falls has been stalled by climate change. This is a double blow on destination Zimbabwe since the country's brand is tied to Victoria Falls. The messaging of the current re-engagement drive revolves around Victoria Falls. Consequently, it becomes very difficult to inspire market confidence when the nation branding and re-engagement drive are anchored on a tourist attraction already weakened by the negative publicity induced by climate change impacts. [Parks area manager, Participant 5]
> The proposed establishment of the theme park has been curtailed by climate change as the prospective investors who are not well informed about the realities on the ground are now sceptical about the project. Climate change impacts have unsettled potential future investment in the tourism sector. This has seriously undermined the tourism special economic zone status granted to Victoria Falls. [Environmental officer, Participant 17].

The above analysis reinforces the narrative that climate change affected the image, brand, goodwill, investment, core product and re-engagement programme which are critical aspects of tourism development. Victoria Falls features prominently in Zimbabwe's nation branding initiatives by virtue of its lofty status as the country's prime tourist destination and by extension brand. This points to a need to decouple the country's brand from Victoria Falls from a marketing perspective. Tourism development depends on the creation of powerful brand names recognised in the

marketplace. To this end, climate change taints Victoria Falls brand which ultimately undermines tourism development. The development of Victoria Falls tourism sector needs international scaffolding. As already noted in previous studies, Zhou (2018b) and Woyo (2021) the resort town depends on overseas tourism market, a market disrupted by the climate change phenomenon.

The finding supports Rosello and Waqas (2015) who concluded that climate change affects the comparative allure of tourist regions as is the case with Victoria Falls whose pristine status and aura have been impaired. Hamzah et al. (2012) and Vilan et al. (2019) also assert that climate change indirectly impact and poses risks to tourist destinations. One such indirect risk is a negative image that is attributed to the tourist destination after a climate change induced catastrophe. Naturally, any climate change induced negative phenomena on tourist sites tend to deflate tourism market confidence. In the aftermath of any negative phenomena induced by climate change, it is the responsibility of the national tourist office together with the private sector to undertake marketing campaigns to restore market confidence. This was evident at Victoria Falls when the news headlines reported the 'drying of the rainforest' and the 'retreating' of the falls, the government of Zimbabwe embarked on an advertising campaign to spruce up the image of the country's top tourist destination. Similarly, Victoria Falls tourism operators, driven by the desire to protect their business interests, sponsored advertising media houses and personalities aimed at reassuring the unsettled market.

Dim long term prospects of tourism business

Several participants observed that climate change impacts threatened the long term viability prospects of tourism business across the tourism value chain including tour operators, travel agents, hotels, and airlines among others as a result of a drop in tourist numbers. This aspect is summarised with the following quotes:

> Victoria Falls is southern Africa's tourism hub, however, the issue of climate change threatens the future prospects of tourism business. The reality is that tourism at Victoria Falls is anchored on the falls as the main tourist attraction, wildlife, rainforest yet these are the products hit hard by climate change. Given the vulnerability and fragility of these products to climate change it would be very difficult to sustain tourism business in the long term. [Guest house manager, Participant 18]
>
> Victoria Falls is incorporated in southern Africa tour packages by most tour operators, hence their businesses have been hurt, and some operators have already indicated their intentions to cease operations citing the retreating falls and drying of the rain forest. The future prospects of airlines, tour operators, travel agents, accommodation service providers, NTOs, national parks business is on the brink. [National tourist office regional manager, Participant 11].
>
> At this rate, the situation is poised to worsen in light of the increasing frequency of such extreme weather phenomena. Certainly, this would prompt tourism investors to divest and seek alternative investment destinations, which are secure. [Events coordinator, Participant 9]

This particular finding is at variance with the principles of tourism development which require continuous investment, be it in new products or superstructures. Given the threat of climate change, future prospects of tourism development are in jeopardy as foreign direct investment (FDI) through green field ventures cannot be guaranteed. Tour operators and travel agents within southern Africa who have been relying on Victoria Falls as part of their packages, for example, South Africa, Kenya, and Tanzania have been greatly affected. The decrease in tourist numbers is ominous for tourism development at Victoria Falls. The same applies to airlines like South African Airways, Ethiopian, and Kenyan Airways who recorded a sharp drop of bookings following the news that the falls were retreating. Demand for airline services mostly comes from tourists who visit Victoria Falls specifically for the scenic view of the falls and rain forest.

At a local level, other tourism stakeholders whose operations were affected by climate change include the national parks, the rainforest, restaurants, accommodation providers, and local council. The consequences were manifold: reduced gate takings; less demand for accommodation, depressed food and beverages sales, reduction in taxes and other levies collected from tourism related enterprises for the local council. Destination management organisations, cruises in the Zambezi river, and wilderness safari companies and related value chains were equally affected by climate change.

Conclusion and implications

The main goal of the study was to examine the impacts and risks of climate change on tourism development at Victoria Falls. This research enhances our understanding of the interplay between climate change and tourism development. The climate change phenomenon could be an opportunity for Zimbabwean destination authorities to decouple the tourism sector's overly reliance on the Victoria Falls given the evolving climate change risks and impacts on the overall tourism development trajectory. The study laid bare the impacts of climate change on tourism development in Victoria Falls, which overall threatens the future prospects of the sector. It is about time that climate change risks are incorporated in the tourism sector development strategies both at national and local levels as a way of forestalling full scale devastating consequences.

Key insights have emerged from this study. Firstly, the risk of climate change on Victoria Falls is unique. It is located in the threat of the disappearance of key features of an attraction. The climate change phenomenon has created a dilemma for local tourism business operators. The local tourism operators and authorities seem not to have much head room to craft a magical climate change proofing and adaptation strategy given the unique nature of the threatened features of the tourist attraction. Intertwined to this aspect is the threat posed by climate change to the world heritage status or label bestowed on Victoria Falls. This is significant in light of the growing pressure on the falls and rainforest, key elements against which the UNESCO world heritage site status is anchored. The removal

of Victoria Falls from the list of world heritage sites would have profound repercussions on the overall tourism development in the resort town.

Secondly, the situation prevailing in Victoria Falls is not hopeless. Local tourism authorities can navigate the climate change risk hurdle by revisiting tourism offerings and product packaging models to reflect the threat of climate change, for example, inclusion of multi destination sites on the product catalogue outside Victoria Falls. This would ensure that tourists have encounters with wildlife, and that their vacation period is not shortened. Additionally, there is a need to scale up investment in other tourist sites less prone to climate change risk as a way of diverting part of tourism demand to such tourism sites. This seem to align with the majority of tourism stakeholders' view, which suggest that destination Zimbabwe shift its focus from the Victoria Falls and invest in other competitive tourist centres like the Eastern highlands and cultural tourism resource base which is remotely connected to climate change.

The study recommends sharing of climate change data among various arms of government and tourism value chains to ensuring that stakeholders are better informed and equipped with requisite knowledge of climate change dynamics. This would ultimately raise their awareness level of climate change risk and put in place timely responsive strategies. Overall, the sharing of climate change information between government and private sector would inform the development and packaging of tourism product catalogues, marketing and promotional campaigns and inspire innovation thus strengthening collaborations, which spur sound tourism development.

The study contributed to the evolving climate change impacts and tourism development discourse especially destination branding, tourist product re-orientation, climate change information asymmetry, and threat to world heritage status aspects. These issues have not been unravelled in previous climate change studies in the context of tourism development at Victoria Falls. The perspectives reported in the study applies to the Victoria Falls tourism stakeholders; therefore, a similar study is suggested at national level to enable a broader perspective of the impacts of climate change to the entire Zimbabwean tourism sector.

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Declarations

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