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Climate Change and Tourism in Namibia: Mapping Emerging Risks and Impacts

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Abstract

The aim of the study was to examine the influence of climate change risks that lead to a polycrisis in the tourism sector, creating a substantial and persuasive challenge to the tourism sector in Namibia. The research study employed a qualitative approach, allowing for an integrated analysis by the researcher. Interviews were conducted with the Ministry of Environment, Forestry, and Tourism (MEFT) to comprehend the impacts of climate change on tourism and the resilience approaches and adaptation strategies for the future of tourism in Namibia. Research materials are based on 15 purposively sampled officials from MEFT and 5 selected managers from Gondwana Collection Namibia, through a snowball sampling technique. The study findings reveal that both MEFT and business operators suggest that droughts and floods are not isolated or temporary threats but rather systemic and escalating processes affecting natural systems, conservation efforts, and communities and their livelihoods. This study contributes to the body of literature by critically examining the current problems with the polycrisis of climate change in sustainable tourism.

Keywords Climate change; polycrisis; tourism resilience; impacts; systemic risks

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Introduction

Namibia's tourism is regarded as the primary contributor to the country's economy (Dowling & Grünert, 2018; Green, 2022; Ministry of Environment, Forestry, and Tourism - MEFT, 2023). As such, tourism is a prioritised sector in the Namibian National Development Plans (NDPs), which requires reinforcement against all external risks and shocks that deter its growth (MEFT, 2023; Okitasari & Katramiz, 2022). However, Namibia's tourism industry faces growing challenges that are directly and indirectly related to climate change, leading to increasing systemic risks in the future (see Esade, 2023; Hoogendoorn & Fitchett, 2018; Kimaro et al., 2023). Indeed, the severity and frequency of extreme occurrences, such as droughts and floods, have increased in Namibia over the past years (see Fonjong, 2024; Nhamo et al., 2025; Pizzorni et al., 2024; Tervo-Kankare et al., 2018). Based on this, the sustainability of the Namibian tourism industry is in danger and calls for adaptive management and resilience building. According to Maphanga et al. (2025), effective sustainable adaptation strategies necessitate an understanding of the environmental change impacts as well as the ability to estimate the effects of climate change at the national level. However, it appears that systemic approaches and knowledge that address climate change challenges for the tourism sector are still limited in Namibia. The purpose of the present study is to examine how some of the key stakeholders - the officers at the Ministry of Environment, Forestry, and Tourism (MEFT), and business representatives from the Gondwana Collection Namibia- perceive and evaluate the current and future impacts of climate change to the country's tourism sector. In this respect, the study aims to contribute to the growing literature on the impacts of climate change in Southern Africa (see Saarinen et al., 2022).

Tourism and climate change issues and impacts in Namibia

Tourism is a vital sector that significantly contributes to economic growth and employment creation in Namibia (Green, 2022; Nguyen et al., 2025; MEFT, 2023). At the same time, however, the sector is highly vulnerable to environmental change risks and impacts as well as other social and political uncertainties in its operational context (see Kimaro et al., 2023; Lawrence et al., 2024; Renn, 2024; Talukdar et al., 2024; Ullah et al., 2024; Williams & Balaz, 2014). However, climate change, specifically, poses a pressing threat to Namibia's tourism industry, as it may have both direct and indirect effects on the industry's resilience and sustainability in the future (see Danquah et al.,2025; Hoogendoorn & Fitchett, 2018; MEFT, 2023). Climate change is a multiscalar process that impacts the environment, economics, and social structures simultaneously (Zhang et al., 2023), and by doing so, it may exacerbate preexisting economic and social inequalities and fuel instability and conflicts (see Fonjong et al., 2024; Henrico & Doboš, 2024; Kahn et al., 2021; Sillmann et al., 2022).

Paradoxically, climate change may lead to socio-economic strategies making the tourism sector even more important in Namibia in the future, as many other livelihoods are also highly vulnerable to global warming effects. Essentially, not unique to Namibia, the problem of drought has impacted various countries and popular travel destinations (see Dube et al., 2022). Indeed, Namibia has already experienced more prolonged and intense droughts, irregular rainfall, and desertification, resulting in crop failures, livestock deaths, and water shortages (see MEFT, 2022a; MEFT, 2023b; Esade, 2023). In the future, climate change is anticipated to further strain the country's water supply, worsening inequalities in water access and increasing the vulnerability of rural communities dependent on agriculture and livestock (see Higgs et al., 2025; Hoogendoorn & Fitchett, 2018; Matimolane & Mathivha, 2025; MEFT, 2023; Rogerson, 2017).

Nonetheless, climate change has a significant impact on water, altering precipitation patterns in many regions of Namibia, making it challenging to manage the country's water resources sustainably (see Abbas et al., 2023; Bellwood-Howard et al., 2022; Chivambo et al., 2025; Nazli et al., 2024). Furthermore, an increase in crop failures and droughts may force rural residents to migrate in search of work, food, and water, which would result in overcrowding in urban areas and strain already overburdened housing, public services, and infrastructure (see Hermans et al.,2021; Morais et al., 2019; UN, 2020; World Bank, 2024). Such changes may further cause local population migration to different regions, affecting economic growth (see Siddiqui & Imran, 2022; Yang et al., 2025).

In general, Malla et al. (2022) define climate change as long-term changes in temperature and weather patterns that are principally caused by the likelihood of global warming from emissions from fossil fuels (see Vasseur, 2022). With two major desert landscapes, such as the Namib and Kalahari Deserts, Namibia is regarded as the driest country in Sub-Saharan Africa, with a considerably greater degree of aridity (see MEFT, 2023; Mupambwa et al., 2019). In addition to droughts, climate change creates high-temperature variability, sea level rise, and/or changing rainfall patterns, which trigger flooding, for example (World Bank, 2021; Hoogendoorn & Fitchett, 2018; MEFT, 2023). UNISDR (2018) concurs that the most frequent hazard in Namibia is flooding, which is particularly severe in the north-central regions of Oshikoto, Omusati, Ohangwena, and Oshana, as well as the northeastern regions of Kavango and Caprivi. Floods have become more common and repeated, with far-reaching implications for infrastructure and livelihood due to their damaging effect (see Balgah et al., 2023; Busayo et al., 2022; Chen et al., 2023; Van Der Byl, 2017). Global biological diversity is impacted by climate change in several direct and indirect ways, which exacerbate the consequences of pre-existing challenges to wildlife biodiversity caused by unchecked and exploitative human activities (see Bhat et al.,2024; Prins et al., 2025; Yang et al., 2025; Wang et al., 2025). In addition, climate change impacts various species and their habitats, leading to alterations in the structure and function of ecosystems (see Diaz et al., 2019; Mukul et al., 2019). However, the effects of wildlife migration are less well understood, and the ramifications are especially significant for nature-based and wildlife tourism (see Bollig, 2024; Shaw, 2020; Stone & Stone, 2024). This is because wildlife movement is impacted by climate change, which in turn affects tourists' opportunities to observe flora and fauna (see Coldrey & Turpie, 2020; Geldard, 2023; Moore, 2011; Mpakairi et al., 2020; Mushawemhuka et al., 2018). As a result, tourism in places like Etosha National Park and other tourist-protected regions may be significantly impacted (see Chambwe & Shereni, 2024; Chiwaridzo & Dzingirai, 2024; Kwinje et al., 2025).

Furthermore, it is expected that climate change led to a polycrisis of more frequent extremes, such as heat waves and extremely cold waves, which have an impact on people's health (Zhang et al., 2023). Polycrisis, according to Tooze (2025), is a framework for understanding the assortment of interconnected critical issues that face humanity: it is “a cluster of related global risks with compounding effects, such that the overall impact exceeds the sum of each part” (World Economic Forum, 2023, p. 57). Thus, it may exacerbate preexisting economic and social inequalities and fuel instability and conflicts (Kahn et al. 2021; Saarinen et al., 2024; Sillmann et al., 2022; Zahnow et al., 2025). Due to this connection with polycrisis, the effects of climate change are both extensive and difficult to estimate on how they will affect the tourism industry and its systems (see Ullah et al., 2024; World Bank, 2024). Comprehensively, the effects of climate change in Namibia have significant societal repercussions beyond the tourism sector (see Nikodemus & Hájek, 2022). Still, these wider changes will also have major impacts - directly and/or indirectly on tourism. Rather, climate change has a substantial impact on tourism, which is susceptible to both direct and indirect physical impacts that could alter a destination’s inherent appeal (see Lenzen et al., 2018; Lopez-Doriga et al., 2019; Maoela et al., 2025). Thus, understanding the effects of climate change is critical to ensuring Namibia’s environmental and economic resilience.

Methodology

This study employs a qualitative research methodology to gain a deeper understanding of how some of the key stakeholders in the Namibian tourism sector perceive, understand and interpret the emerging impacts of climate change. Qualitative research allows for an exploration of human thoughts, perceptions, and their meanings in a holistic way (see Morse, 2016). Given the exploratory nature of the research, particularly regarding climate change risks and impacts, this approach was deemed suitable for understanding this relatively emerging crisis that may result in a variety of issues in Namibia and beyond. The fieldwork, conducted in June 2025, involved face-to-face semi-structured and in-depth interviews to collect data on the impacts of climate change on sustainable tourism in Namibia. The sample consisted of 15 participants: 10 purposively sampled officials from MEFT and 5 from the tourism company called Gondwana Collection-Namibia (Table 1).

Table 1: MEFT and Gondwana Collection-Namibia Profiles

Pseudonym	Gender	Position	Organisation	Place
P1	Male	Director	MEFT	Windhoek HQ
P2	Female	Lodge Manager	Gondwana-Collection Namibia	Zambezi Lodge
P3	Female	Tourism Officer	MEFT	Windhoek HQ
P4	Female	Lodge Manager	Gondwana-Collection Namibia	Windhoek HQ
P5	Male	Deputy Director	MEFT	Windhoek HQ
P6	Female	Wildlife Warden	MEFT	Windhoek HQ
P7	Female	Environmental Manager	Gondwana-Collection Namibia	Windhoek
P8	Male	Conservation Scientist	MEFT	Windhoek HQ
P9	Male	Chief Warden	MEFT	Windhoek HQ
P10	Male	Lodge Manager	Gondwana-Collection Namibia	Fish-River Canyon Lodge
P11	Female	Economist	MEFT	Windhoek HQ
P12	Female	Environmental Officer	MEFT	Windhoek HQ
P13	Female	Tourism Officer	MEFT	Windhoek HQ
P14	Male	Tourism Officer	MEFT	Windhoek HQ
P15	Female	Operations Manager	Gondwana-Collection Namibia	Anib Lodge

The snowballing technique was primarily used to identify managers and MEFT officials with extensive experience and knowledge in climate change, policy, and planning. Interviews were recorded and then transcribed as part of the data-gathering procedure. This piloting exploratory study reports a thematic analysis to indicate general patterns and to find recurrent themes from the interview data (see King et al., 2019; Ahmed et al., 2025), which will be later analysed further. Table 1 illustrates the demographic summary of the 15 participants, i.e. interviewees in this study. Pseudonyms were used in place of the interviewees' names, with P standing for Participant. Obviously, the study findings reflect the opinions of these MEFT officials and Gondwana Collection-Namibia managers, and therefore, caution should be exercised when generalising these findings to different contexts and stakeholders.

Perception of current and future impacts of climate change in Namibia

Thematic analysis was employed to identify and explain general themes from the interviews. They revealed two core themes: Direct climate change impacts on tourism in Namibia and Indirect infrastructure damage and induced wildlife-human conflicts in Namibia. In addition, there were several sub-themes that cut across the core themes: drought's effects on tourism; rising sea level risks in coastal areas; and effects of floods on wildlife and tourism in Namibia.

Direct climate change impacts on tourism in Namibia

Climate change risks were seen to increase and cascade. One interviewee (P13) stated: "I believe that drought is a big problem for our country, and climate change is becoming increasingly unpredictable, making the drought worse." Furthermore, P1 indicated that "Flooding disrupts key transport and tourism infrastructure, especially in rural and low-lying areas, highlighting systemic weaknesses in infrastructure design and maintenance." P14 interviewee said that "Most of the damage has been done to the roads, especially on gravel roads, with parts of northern roads 'partially submerged." Overall, the interviewees highlighted the effects of drought on infrastructure and wildlife, indicating a worsening crisis that threatens water security, animal survival, and the viability of tourism, exposing both ecological and economic fragilities. The findings posit that prolonged dry spells have led to dwindling water sources, forcing wildlife into concentrated areas and increasing human-wildlife conflict (HWCs). In assertion, evidence from literature stressed that climate change impacts wildlife movement, which affects tourists' change in flora and fauna viewing experiences and satisfaction (see Coldrey & Turpie, 2020; Geldard, 2023; Singh et al., 2025; Zhou & Chibaya, 2025). The interviewees indicate that drought is not an episodic event but a rapidly intensifying and 'common' national crisis that is driven by climate change. This perspective was rooted in direct observation of environmental degradation and wildlife distress, reinforcing the severity and systemic nature of the issue. Coastal infrastructure, storm resilience, and public health in Namibia were seen to be at risk due to rising sea levels. Participants voiced worries that Namibia's coastline tourism infrastructure may become more vulnerable to extreme weather and sea level rise. This finding is in tandem with Hoogendoorn & Fitchett (2018). All embracing, the future changes for Namibian tourism will be shaped by increasing climate pressures, including water scarcity, erratic weather patterns, and rising sea levels, all of which threaten wildlife, infrastructure, and visitor experiences. For example, one interviewee (P12) stated that "Rising sea levels are putting coastal communities at risk and already threaten vehicles, infrastructure, and coastline access, particularly in popular tourist locations like Swakopmund." Indeed, the interviewees collectively brought attention to the dangers that rising sea levels pose to coastal communities and popular tourist destinations like Swakopmund and Walvis Bay, even though sea level rise is not yet particularly noticeable in Namibia. However, many supply chains will be severely impacted by the threat posed by rising sea levels and coastal erosion to ports. Furthermore, riverine and flash floods will be potentially triggered by sea level rise, as indicated in several policy documents (see World Bank, 2021; Hoogendoorn & Fitchett, 2018; MEFT, 2023).

Indirect infrastructure damage and induced wildlife-human conflicts

Flooding was seen as critical for both tourism facilities and supporting infrastructure. For example, "Lodges that are very close to the Kavango River... were closed off because they were completely flooded, leading to temporary shutdowns and financial losses" (P10). P15 stated further that "Recent flooding, especially in regions like Kunene, Erongo, and Kavango, has damaged infrastructure, disrupted access for tourists, and isolated communities." These accounts collectively demonstrate that seasonal flooding inundates critical tourism infrastructure, particularly in ecologically sensitive or low-lying areas, leading to temporary closures and disruptions in visitor and community access. The vulnerability of remote lodges and roads are primary flood-related risks that impede accessibility, which may lead to guest cancellations, while also creating negative perceptions about safety among potential tourists. Flooding fundamentally undermines Namibia's tourism industry's physical underpinning, putting visitor safety and logistical dependability at risk. Indeed, flooding consistently disrupts Namibia's tourism by damaging transportation networks, accommodations, and urban infrastructure, limiting access to key destinations. The cyclical nature of damage and repair suggests a reactive rather than resilient approach to infrastructure planning in flood-prone zones, thus revealing a critical tension between sustainable tourism and infrastructure resilience. Regarding these findings, Levy & Patz (2015) have stated that climate change exacerbates a polycrisis that further impacts the environment and lives of many low-income nations and could lead to a lack of progress towards achieving the Sustainable Development Goals (SDGs).

Conclusions

The objective of the piloting study was to explore the influence of climate change risks and impacts on Namibia's tourism industry. The findings based on thematic analysis demonstrate the core issues and challenges that Namibia's tourism sector faces. These are obviously dominated by climate change, seemingly perceived as the defining challenge for the future of Namibia's tourism sector. The findings indicate that both MEFT and business operators suggest drought and floods are not isolated or temporary threats but a systemic and escalating polycrisis affecting natural systems, conservation efforts, and communities. With drought and flooding emerging as the most impactful, these two threats seem to significantly weaken Namibia's tourism by disrupting long-term tourism sustainability, interrupting tourism operations, and causing wildlife mortality and/or migration, which are central to Namibia's tourism products based on safari and wildlife tourism. It is obvious that intensified droughts and floods, which are accelerating stressors on Namibia's tourism resilience and sustainability, call for urgent and integrated response plans and strategies to mitigate their detrimental effects in the future. Climate change in Namibia is an intensifying issue for its tourism sector, which needs attention and further research and requires holistic management strategies to minimise its impacts in the years to come. Likewise, policymakers should develop strategies that would assist resilience building on the pressing effects of climate change. Besides, more robust national policies that incorporate ecological, infrastructure, and governance components together with localised adaptation strategies are required. However, these strategies could include elements of adaptive management in the tourism sector and tourism-dependent communities (see Saarinen et al., 2020). There is also a need for proactive measures, including visitor dispersion strategies, strengthened business climate adaptation plans, and investment in infrastructure. Based on this pilot study, there is a need for improved, climate-resilient approaches as well as integrated adaptation strategies that address economic, social, and environmental factors that will be increasingly impacted by climate change and related crises.

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