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# Editorial: Climate change, human-wildlife interactions and sustainable tourism nexus in protected areas

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## Editorial on the Research Topic

Climate change, human-wildlife interactions and sustainable tourism nexus in protected areas

The UN Convention on Biological Diversity's post-2020 global biodiversity framework (UNGBF) recognizes climate change and human-wildlife interactions as issues of global concern (IUCN, 2024). The IPCC (2018) defines climate change as “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.” Climate change is one the drivers for complex human wildlife interactions (HWIs) across the globe. Nyhus (2016) defines human wildlife interactions (HWIs) as the association or activities/actions of humans and wildlife toward each other in areas where they geospatially overlap. Habitat overlap results in competition for natural resources between human and wildlife, with consequences on human food security and socio-ecological wellbeing. Thus, HWIs can occur in various ways and differs varies in terms of rate of occurrence thereby impacting both humans and wildlife by imposing adverse effects that may result in at least three outcomes, that is, conflict, and/or neutral or even uplifting/positive effects that underlie their mutual coexistence (Woodroffe, 2005; König et al., 2020). Interactions between humans and wildlife occur across a variety of landscapes ranging from urban areas (Schell et al., 2021), rural areas, peri-urban (Soga and Gaston, 2020), resettlement areas (Chakuya et al., 2024), and the buffer zones adjacent close in proximity to protected areas. HWIs can result in human-wildlife conflicts (HWCs). The IUCN (2022) defines human wildlife conflict as “struggles that emerge when the presence or behavior of wildlife poses actual or perceived, direct and recurring threat to human interests or needs, leading to disagreements between groups of people and negative impacts on people and wildlife.”

Human responses to the impacts of climate change such as habitat restoration and water provision in the conservation and tourism sector (Dube et al., 2022) create conditions which allow wildlife to thrive. However, climate change poses a challenge to society by influencing tourism sector investment, planning, operations, and demand (Scott, 2021). In addition, climate change induced extreme events such as drought, tropical cyclones, floods, and heat waves/stress can result in direct and indirect impacts on natural systems resulting in disruption of ecosystem services. Drought, in particular compromises the availability of provisioning ecosystem services such as water and food leading to habitat overlap between humans and wildlife. For example, Dube et al. (2022) mentioned that drought phenomenon has been increasing in both frequency and intensity globally with impacts on tourist destinations in sub-Saharan Africa and beyond. Southern Africa communities in particular suffer from the intertwined issues of poverty (most live below the poverty line), the increasing impacts of climate change (prolonged and frequent droughts), natural habitat conversion, and land degradation. The resilience of ecosystems is negatively impacted as are the livelihoods and food security of rural communities. Eighty percent of the people are heavily dependent upon natural resources and live largely from subsistence agriculture (shifting cultivation). This calls for the need to promote sustainable tourism practices to ensure resilience building for all.

Climate change effects impact on HWCs and strategies to manage such conflicts must consider the unique multifaceted nature of human wildlife conflicts which incorporate ecological, cultural, social, historical, physical, economic, and political characteristics. It is important to note that humans have interacted with wildlife since time immemorial. However, literature has tended to focus more on the negative side of interaction (human wildlife conflict), yet not all interactions are negative (Bhatia et al., 2019). Abrahms et al. (2023) noted that climate change and human-wildlife conflict are both pressing challenges for biodiversity conservation and human wellbeing in the Anthropocene. Climate change is a critical yet underappreciated amplifier of HWC as it exacerbates resource scarcity, alters human and animal behaviors and distributions, and increases human-wildlife encounters (Abrahms et al., 2023). Climate variability and change percolate via complex social-ecological systems to influence patterns and outcomes of human-wildlife interactions. In addition, human-wildlife interactions are often driven by underlying factors including knowledge, attitudes and perceptions toward costs and benefits accrued from wildlife and community-based conservation initiatives. Thus, HWIs impose costs-to-benefits tradeoffs to humans and wildlife, and thereby impact both in complex, sometimes paradoxical ways.

Over the years, sustainable tourism has been advanced as the vehicle for advancing the sustainable development agenda and as a mitigatory tool to HWC from the tourism perspective. The United Nations Environment Program and UN World Tourism Organization (2015) defines sustainable tourism as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities.” To a greater extent, it is religiously regarded as the most ideal form of tourism that creates sustained benefits for the triple P (People, Planet, and Profit), and

if properly practiced, it contributes to the attainment of multiple sustainable development goals (SDGs). However, the negative effects of climate change are seemingly undermining the very essence of sustainable tourism (Chiwariidzo and Dzingirai, 2024), especially in the fragile tropical areas where most of the tourism is based on wildlife resources. The impacts of climate change highlight the interconnectedness between various stakeholders and sectors, including private enterprise, protected area visitors, local communities, government, and non-governmental organizations.

This Research Topic includes four articles focusing on local community perceptions of benefits from CBNRM initiatives; ecotourism practices; mainstreaming climate change in CBNRM policy and status of HWI at the agriculture wildlife interface. The first article by Dhliwayo et al. focuses on “Local perceptions on poverty and conservation in a community-based natural resource program area: a case study of Beitbridge district, southern Zimbabwe.” It assesses local community perceptions and participation for livelihood enhancement in a Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) environment situated at the boarder of protected area, Zimbabwe. The area experiences incessant droughts, low rainfalls, flash floods, and high temperatures continue to threaten livelihoods in this ward and its surroundings (Dhliwayo et al.). The article reveals that the local community under study views CAMPFIRE as one of the key solutions to poverty alleviation despite the lack of active local community participation in decision-making processes. The study recommends active and full participation of local people in the decision-making processes, including previously marginalized groups, in the CAMPFIRE initiatives.

The second article by Miller et al. presents a brief research report on “Ecotourism, wildlife conservation, and agriculture in Costa Rica through a social-ecological systems lens.” Parks and protected areas have long been promoted for their environmental conservation benefits, opportunities for outdoor recreation and nature-based tourism, and associated economic opportunities. The paper adopts the socio-ecological systems (SES) framework to assess missions, goals, and management practices from diverse stakeholders engaged in ecotourism using a case study of a regional tourism hub in northwestern Costa Rica. The study revealed both positive to negative, forming a four-quadrant framework. The authors argue that this framework is more representative of this highly complex system of ecotourism than traditional human-impact research and provides a more holistic understanding of the nature-based recreation ecosystem.

The third article by Mupunga and Shoko focuses on “Local community perceptions on human wildlife interactions in the face of climate variability.” Using a case of Nyaminyami community, Zimbabwe, the authors reveal that climate change and variability and tourism activities are determinants of human-wildlife conflicts in a semi-arid environment in the Nyaminyami community in Mashonaland West, Zimbabwe. The study also notes that human wildlife interactions manifests itself as human wildlife conflict, and that anthropogenic factors contribute immensely to an increase in the problems faced by local communities. The study also reports that climate change interacts with multiple anthropogenic induced factors such as competition for resources, settlement in wildlife corridors, agricultural activities, and tourism and thereby

exacerbating human wildlife conflict. The study recommends education and awareness on climate change adaptation and proper land use planning as strategies for reducing the negative effects associated with human-wildlife conflicts hence promoting climate resilience. Climate change adaptation and coping strategies including the crafting of strategies that enable local residents to benefit from tourism activities can help reduce human wildlife conflicts.

The fourth article by Chikuta et al. presents a review on “Mainstreaming climate change in policy frameworks for community-based natural resource management in a semi-arid savannah environment: case study of Botswana.” The review paper interrogates the extent to which CBNRM initiatives mainstream climate change in their agenda using a case study of the policy framework of Botswana’s CBNRM program. The findings from policy analysis indicate that the climate change agenda is woven into more recent key legal and policy documents on CBNRM on one hand, while on the other hand, the climate change policy documents also include components that speak to CBNRM. This implies that the tourism sector can leverage these provisions to strengthen climate resilience through transformative adaptation and mitigation action. All articles published in this Research Topic embraced the SES framework components to unveil the nexus between climate change, human wildlife interactions and sustainable tourism part of a broader green economy, climate change and biodiversity economy initiatives which are critical in the tourism sector to promote local community participation, sustainable livelihoods and wellbeing in the face of a changing climate.

## Author contributions

OK: Conceptualization, Supervision, Validation, Writing – original draft, Writing – review & editing. CNM: Writing –

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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