

Climate change policy in a world of uncertainty: Changing environment, knowledge and tourism in Botswana

Abstract

Tourism is an important economic sector in the Global South, but it is also among the sectors most vulnerable to the risks and variations associated with global climate change. The paper investigates how issues surrounding uncertainty in the climate change discourse have influenced policy makers' response to climate change in Botswana with respect to the tourism sector. A number of constraints hamper progress in policy response measures including inadequate knowledge and the extent to which climate science can be trusted. A qualitative approach comprising in-depth interviews was adopted for the study. The analysis of the empirical data demonstrates that some policy makers are still sceptical about climate change and its impacts on tourism despite growing evidence from scientific studies and the Intergovernmental Panel on Climate Change (IPCC).

Key words: Botswana, climate policy, knowledge, policy makers, tourism, uncertainty.

1. Introduction

Climate change is considered the leading human and environment crisis of the 21st century (Tadesse, 2010), demonstrating the idea of the Anthropocene and the Earth's limits to growth (Rockström et al., 2009). As a result of global climate change and other impacts of human activities, localised extreme weather events such as heat waves, droughts, extreme rainfall events, flooding and damaging winds have increased (Gemedo & Sima, 2015; International Panel on Climate Change (IPCC), 2013, 2014). Changes in climatic conditions affect the tourism sector, which is a large and constantly developing economic field in the Global South (IPCC, 2013; Rainer, 2018; Rossellò-Nadal, 2014; United Nations (UN), 2017; United Nations Conference on Trade and Development (UNCTAD), 2017). Different forms of nature-

based tourism, such as ecotourism and wildlife tourism are highly reliant on ecosystems that are transmuting due to climate change. Although climate change is a global environmental crisis, it does not impact world regions equally as different places have different levels of vulnerabilities, adaptive capacities and resilience (IPCC, 2014). Generally, the Global South and specifically Africa is perceived more vulnerable and threatened than the regions in the Global North (Nugent, 2019).

The African continent is one of the most vulnerable due to its low adaptive capacity, the consequences of which are felt in both the human and natural systems (Gemedda & Sima, 2015; Serdeczny, et al., 2016). This is problematic for the success and resilience of the tourism industry (Calgaro, Lloyed & Dominaey-Howe, 2014; Lew, 2014; Saarinen & Gill, 2019). One of the key aspects in adaptation and adaptive capacity relate to knowledge and learning, which is often seen as limited among the industry operators and policy-makers guiding and coordinating the development of tourism (see Hambira, 2017; Hambira & Saarinen, 2015).

Research on Africa's climate and tourism-climate change nexus has not fully answered questions on how and on what scale the changing environment will impact the tourism industry, communities dependent on it and regional economies. As a result, policy responses and measures needed by the various actors regarding tourism development and climate change have not been effusively explored. A recurring question is how policy makers can synthesize climate predictions marred with uncertainty and formulate policy that would lead to better adaptive capacity and, finally, resilient and sustainable tourism (Schneider & Kuntz-Duriseti, 2002; Hawkins & Sutton, 2011; Saarinen & Gill, 2019). Despite the uncertainty associated with General Circulation Models (GCMs) based climate predictions, sustainable management decisions still have to be made (Lindner et al., 2014). Uncertainty in climate predictions might

not be resolved in the near future (Schneider & Kuntz-Duriseti, 2002; Heal & Millner, 2014), but this should not prevent policy-makers from using the predictions to put response measures in place.

This paper therefore seeks to answer the question; how have issues of uncertainty surrounding climate change influenced policy-makers learning, knowledge and, especially, responses to climate change with respect to the tourism sector in Botswana? The country provides a good case study as the tourism industry is increasingly as an economic diversification tool for local and regional development (Botswana Government, 2009; Republic of Botswana, 2017; Saarinen, Moswete & Monare, 2014). At the same time, the industry and its key touristic products and experiences are highly dependent on natural environment which is increasingly under the threats of climate change (Hambira, 2011).

2. Climate change policy in a world of uncertainty

According to IPCC (2014), total Greenhouse Gases (GHG) emissions continue to increase despite a growing number of mitigation policies. This shows that positive response to climate change by stakeholders is still lacking and is not keeping up with the effects of the Anthropocene and ever rising human populations and economic growth globally. This is particularly so for the tourism sector, which, compared to other sectors like water and agriculture, has not advanced much in addressing the tourism-climate change nexus (see Hambira, 2017). Lack of positive response to climate change by policy makers could be due to the fact that available climate change projections have some level of uncertainty which among others is caused by uncertainty in future GHG emission scenarios used to force climate models (Paeth et al., 2017).

However, given the rate at which global environment change occurs, it would be a challenge to overcome uncertainty since decisions have to be made before uncertainty can be resolved (Schneider & Kuntz-Duriseti, 2002). Policy makers therefore need to be equipped with the necessary knowledge and information that would lead to timely and appropriate adaptation and mitigation policies to climate change. Response options available to the tourism sector include relocating operations due to changing conditions (e.g. relocation to higher elevations by ski operators); adapting in situ using technology and seasonality (e.g. re-building beaches artificially); and anticipating challenges (e.g. using forecasting and early warning systems to anticipate threats to tourism and natural ecosystems) (University of Cambridge, 2014). Examples of adaptation measures adopted by tourism enterprises in Africa include actions that deal with increased temperatures (e.g. alteration of activity times) (Hambira et al., 2013) and adoption of climate-friendly facilities (Dube & Nhamo, 2018).

In addition, reduced quality of attractions has been addressed through diversification of the tourism product (Marshall, Marshall, Abdulla, Rouphael & Ali, 2011). Other climate and weather related changes, such as flooding have been addressed by moving guests to alternative safer locations (Mbaiwa & Mmopelwa, 2009) and inadequate awareness of tourism-climate change nexus has been tackled through public awareness campaigns (Shaaban & Ramsay, 2010). On the other hand, mitigation measures include greening of accommodation establishments and aviation sectors through adoption of smart technologies aimed at reducing water and energy consumption as well as research and development in the bid to reducing the carbon footprint (Dube & Nhamo, 2019; Hoogendoorn, Grant & Fitchett, 2015; Rogerson & Sims, 2012). In the aviation sector, for example, the Carbon Offsetting and Reduction Scheme for International

Aviation (CORSIA) indicates an attempt to limit the future carbon emissions from international aviation above 2020 levels (IATA, 2019).

When assessing response options, adaptive pathways are able to provide guidance on how uncertainty can be managed (Lawrence et al., 2013). Ultimately, ‘adaptation is a process through which societies make themselves better able to cope with an uncertain future’ (United Nations Framework Convention on Climate Change (UNFCCC), 2007, p10). It is increasingly the focus for policy action in both industrialised and developing countries and thus should take into consideration procedural and distributive justice (Adger, Paavola & Huq, 2006). This is necessitated by the fact that future climate injustices are likely to compound past injustices which have resulted in uneven patterns of development (Adger et al., 2006). Therefore it is believed that developed countries which are historically responsible for climate change should bare the greater burden of adaptation costs (Schlosberg, 2012). Moreover, climate justice requires the protection of the most vulnerable due to the uncertainties inherent in the climate system and climate science (Adger et al., 2006)

Long term sustainable plans that can adapt to changing situations under uncertainty are needed in the quest to achieve economic, environmental and social objectives (Walker, Haasnoot & Kwakkel, 2013). However it is still challenging to advice decision makers on how best to plan for climate change due to uncertainties and other unknowns which are difficult to explain to practitioners at the same time emphasizing the importance of planning for adaptation (Lindner et al., 2014; Schneider & Kuntz-Duriseti, 2002). Decision making under uncertainty should however take into consideration the motivations and agency of diverse decision makers and the interaction between these decision makers (Roelich & Gieseckam, 2019). In the end, policy makers find it difficult to make decisions that will impact on environment and society with

information that is not precise while at the same time the debate about the level of certainty needed to make firm conclusions is an ongoing matter of discussion in science dialogues (Schneider & Kuntz-Duriseti, 2002). However, Heal and Millner (2014.p134) argue that ‘We have enough information about climate change to understand it is a serious problem that requires immediate policy attention: uncertainty does not imply ignorance.’ Moreover, evidence has come to the fore to the effect that with planned adaptation, tourism can flourish even in the face of climate change (University of Cambridge, 2014).

2.1. Theoretical underpinnings

According to Schneider & Kuntz-Duriseti, (2002), efforts to embrace uncertainty in decision making have led to management approaches such as the Precautionary Principle; Adaptive Environmental Management; the Preventative Paradigm and Principles of Stewardship. These are influenced by the idea of managing uncertainty rather than mastering it which can be linked to the notion of resilience (Schneider & Kuntz-Duriseti, 2002). Hence this paper is informed by the Contemporary Resilience Theory which has its origins in the mathematical sciences and was later adapted to ecosystems by ecologists (Lew, 2014; Saarinen & Gill, 2019). Due to its use in a number of disciplines, various definitions exist including the ability to recover from disturbance without compromising the overall wealth of the system (Schneider & Kuntz-Duriseti, 2002) In general, the basic idea of resilience ‘is one of the major conceptual tools in the environment literature to deal with change’ (Berkes & Ross, 2013, p. 6). In his seminal work, Holling (1973, p. 17) conceptualized resilience as ‘the ability of these [natural] systems to absorb changes of state variable, driving variable, and parameters, and still persist’. Nowadays the concept is applied beyond ecosystem analyses to economic resilience, community resilience and

tourism resilience (see Calgaro, Lloyd, & Dominey-Howes, 2014; Strickland-Munro, Allison & Moore, 2010).

Policy responses such as adaptation to climate change accord economic sectors a platform to be resilient to changes. The complexity of building resilience to climate change requires active participation of relevant actors (Borquez, Aldunce & Adler, 2017). Policy makers are one group of actors instrumental in resilience planning responses. Hence this paper investigates how issues surrounding uncertainty in the climate change discourse have influenced policy makers' response to climate change in Botswana.

3. Case study: Tourism in Botswana

Tourism is a vital sector in Botswana. Between 2011 and 2014, the country was among 18 African countries where the sector contribute more than 10% to GDP (UNCTAD, 2017). In 2017, Travel & Tourism contributed 3.8% to Botswana's Gross Domestic Product (GDP) and was estimated to grow by 5.8% in 2018 (The World Tourism & Travel Council (WTTC), 2018). There were a total of 1, 774,960 visitors received in the country in 2017; out of which 91.4 % were attributable to tourists (overnight visitors) while same day visitors accounted for 8.6 % (152, 372) (Statistics Botswana, 2019). This shows a growth in visitor arrivals compared to previous years of 2016 and 2015 which recorded 1, 574, 000 and 1, 528,000 visitors respectively (CEIC Data (SG) Pte Ltd, n.d).

Botswana's tourist attractions comprise of wetlands, protected wildlife areas, sand dunes and historical sites (refer to Figure 1).

[Insert Figure 1 here]

The wetlands that attract most visitors include the Okavango Delta, Chobe-Linyanthi river and Makgadikgadi salt pans. The Okavango Delta situated in north western Botswana, is the second most visited destination in Botswana (DoT, *n.d.*). The delta is normally flooded during the period April to October (Atekwana, Molwalefhe, Kgaodi & Crusea, 2016; McCarthy, Humphries, Mahomed, Le Roux & Verhagen, 2012; Milzow, Kgotlhang, Bauer-Gottwein, Meier & Kinzelbach, 2009). It offers significant tourist activities such as game viewing, walking trails, *mokoro* (dug-out canoe) safaris (Mbaiwa, 2003). It is also recognised as a wetland of international importance under the Ramsar Convention (Secretariat of the Convention on Wetlands, 2017) as well as a world heritage site under the World Heritage Convention (United Nations Educational, Scientific and Cultural Organisation (UNESCO), 2017). Visitors also frequent wildlife protected areas such as the Chobe National Park and Moremi Game Reserves also situated in Northern Botswana. Game reserves and national parks form 17 % of the protected areas in Botswana (DoT, 2000). They play a significant role in nature-based tourism especially through community-based tourism as part of the broader framework of Community Based Natural Resources Management (CBNRM). Chobe National Park is one of the most popular parks in Botswana (Stone & Nyaupane, 2016) while the Moremi Game Reserve is the most visited tourist attraction in the country according to DoT (*n.d.*). The popularity of sand dunes, as a tourist attraction had been obscure until the implementation of diversification of the tourism product by government through the famous ‘Khawa Dune Challenge’ which started in 2010. Product diversification includes ‘identifying additional product components and new geographical regions’ (DoT, 2000, p.8) hence this broke the monotony of concentration of tourism activity in the northern part of the country. The annual Khawa Dune challenge was started to promote tourism and improved livelihoods in the unique sand dunes of Khawa village

in Kgalagadi south. Activities include quad and motor bike games, sky diving demonstrations, camel rides and races, cultural performances and exhibitions as well as a sale of arts and crafts. As a result there is a flow of tourism into the Kgalagadi area (western Botswana) with great potential growth for domestic tourism. Historical sites comprise of hills, caves and ruins such as the Tsodilo hills, Gcwihaba caves, Matsieng foot prints and the Domboshaba ruins. They provide a rich cultural heritage, hence promote heritage and cultural tourism in the country. Among these, the Tsodilo Hills, located in northern Botswana, is the most popular site of attraction.

Given the importance of the tourism to the country's socioeconomic growth, this paper therefore contributes to a better understanding of the sector and how it can be sustained for future generations in the face of climate change. This is imperative more so that the country's research and innovation program targets tourism (ecotourism in particular) as one of the focus research areas in order to create and sustain national competitive advantage, economic growth and diversification for an efficiency driven economy (Republic of Botswana, 2017).

3.1 Methods

3.1.1 Selection of policy makers

A qualitative approach was employed to determine how uncertainty has influenced policy makers' response to climate change in Botswana. The approach was deemed appropriate since it is normally applied when one wants to determine the perspectives of a cohort of people with regards to a particular problem and how they deal with it (Boulton & Hammersley, 2006).

Eighteen entities comprising of government departments, none governmental organizations and parastatals known to be directly or indirectly involved in tourism and related natural resource management were written official letters requesting for their participation in the study. Follow

ups were made via telephone. Ultimately nine of the 18 identified organizations agreed to participate in the study. All of them were government departments and the interviewees were: Department of Tourism , Department of Meteorological Services, Department of Energy Affairs, Department of Water Affairs, Department of Wildlife and National Parks, Department of Waste Management and Pollution Control, Department of Animal Production, Department of Crop Production, and the Ministry of Environment Wildlife and Tourism. The interviewees were all in management/senior positions and regarded to be in decision makers carder of their respective departments. Reasons for non-participation by other organisations approached were not given in some instances while others did not see the relevance of the study to their operations. For example one institution responded in a letter that ‘the topic is not within our immediate strategy radar screen and therefore we will not add value to your study.’

3.1.2 Data collection

The nine policy makers representing a relatively wide spectrum of governmental institutions were interviewed (face-to-face) in their respective offices using an interview question guide. The questions covered the following topics: the organization’s background information; economic aspects of tourism in Botswana in relation to geographic context; views on environmental changes in Botswana including climate change and what it means for the tourism sector, and last but not least, response mechanisms that could be adopted. Specific questions include: what are the challenges that pose a threat to the tourism sector and its sustainability in the context of changing environment including climate change; what are the tourist attractions that would be mostly affected by climate change; what policy responses could be put in place to abate the situation. The in-depth interviews were carried out in 2012 during the months of August and September and each lasted for about 45 minutes. The information received was

recorded by means of note taking. Voice recording was not used since it can make people, especially when they consider themselves as formal representatives of public organisations, unsettled and makes them sceptical about anonymity.

3.1.3 Data analysis

To analyse the data, thematic analysis was applied. This is a process of identifying patterns or themes within qualitative data which are important or interesting enough to use to say something about the matter being investigated (Maguire & Delahunt, 2017). The record was reviewed, common concepts or themes were identified and interpreted, then summarized into main findings (Kitchin & Tate, 2000). To achieve this, the six steps were applied in analysing the data (see Maguire & Delahunt, 2017). (i) familiarisation with the study (reading and reading data and noting early impressions), (ii) generating initial codes (organising the data in meaningful and systematic manner with the research question in mind), (iii) searching for themes (identifying patterns that capture something interesting about the data), (iv) reviewing the identified themes (modifying and developing themes by checking whether the initial ones make sense), (v) defining the identified themes (what is the theme saying?), and (vi) the write up. Thematic analysis was preferred since it is flexible yet detailed while other approaches such as grounded theory require higher level of interpretative complexity (Vaismoradi, 2013). While content analysis also requires a relatively low level of interpretation like thematic analysis, it may also be applied quantitatively (Maguire & Delahunt, 2017, Vaismoradi, 2013) hence the authors opted for thematic analysis approach which is purely qualitative (see Maguire & Delahunt, 2017). To avoid bias, the authors endeavoured to ensure that the validity and trustworthiness of the interpretation is supported by data and other literature; even though bias in qualitative research may be difficult to avoid since interpretation is often subjective.

4. Results and discussion

4.1 Policy-makers perceptions on changing environment and climate change as a threat to the tourism industry

The policy makers were asked whether there are any challenges that pose a threat to the tourism industry and its sustainability in the context of changing environment including climate change. The question was pertinent as it has a bearing on policy responses. They mentioned the following: resource conflict, urbanization and mining, fences erected for animal disease control, poaching, poor infrastructure development, drought, climate change and the associated fear of the unknown.

4.2.1 Resource conflict

Resource conflict was expressed from the point of view of land use conflict locally and across borders. For instance, competition between livestock rearing and wildlife conservation results in resource conflicts locally due to climate change stresses on natural resources combined with demographic, economic and political pressures. For example, the impacts of climate change on forage could possibly create more competition for water and grazing resources available to wildlife and livestock. One interviewee said ‘they want more land for wildlife management and tourism. It is difficult to force people to venture into tourism which does not bring returns at the house hold level. Government should instead provide a better substitute for livestock’ (I9_Wil). The Okavango Delta is a trans-boundary ecosystem hence it is befitting that interviewees raised trans-boundary issues. The view points of the policy makers are supported by literature. For

example, the utilisation of the Okavango River Basin (ORB) water resources which falls within the countries of Angola, Botswana and Namibia is subject to contradictions and conflicts since ways in which the resource is used upstream have potential negative impacts downstream (Mbaiwa, 2004). Security concerns linked to impact of climate change with regards to the relationship between conflicts, economic development and responses to climate change is still an emerging issue (Hunsberger, Work & Herre, 2018). However some research has concluded that the extent to which climate change could contribute to conflict will depend on the resilience and character of the affected society (Adger & Tompkins, 2004; Sultana & Thompson, 2017).

4.2.2 Urbanization and mining

The encroachment of urbanisation and mining exploration into areas designated for tourism and conservation were regarded as a big threat by the policy makers. Urbanization depends on the interplay between ecosystem services and environmental challenges associated with climate change (Sanchez-Rodriguez et al., 2005). Poor capacity to manage global environmental change (GCE) has been identified as one of the reasons why urban areas are likely to be the target of GCE. Maun and Kasane, the main tourist centres in Botswana, have been growing fast in recent years which could be attributed to the expansion of the tourism industry over the years.

Furthermore, a number of mineral explorations have been conducted in north-western Botswana, the epitome of Botswana's tourism industry (see for example [Tsodilo Resources Limited website](http://tsodiloresources.com) at <http://tsodiloresources.com>). This raises the question of whether Maun is likely to play the dual role of tourist and mining town in the future. The Ngamiland region is endowed with valuable goods of mineral deposits including iron (Tabane, 2012) and copper (U.S. Geological Survey, 2015). The iron coupled with the country's coal deposits provides opportunities for a

steel industry (Tabane, 2012). Jusoh, Mohammed & Puad (n.d) emphasize that the importance of tourism sector requires that, space and tourism area be protected from unsustainable use, taken over by other land uses through intrusion. One of the policy makers who purported that urbanisation and mining are a threat to tourism emphasised that ‘we must learn the concept of sustainable cities...we need them since it is difficult to do away with urban growth.’ (I1_Ene). Interviewee’s stance implied that urbanisation of rural tourism destinations is inevitable and therefore it was important for this to take place in a sustainable manner.

4.2.3 Fences erected for animal disease control

Fences erected to protect wildlife or people can be a useful conservation tool while at the same time they can be counterproductive hence the opinions of interested parties including scientists and decision makers on their usefulness are divided (Durant, Becker, Creel et al., 2015). It was therefore not surprising that some interviewees were of the view that fencing adopted as a measure for animal disease control is a risk to tourism. That is, measures taken to safeguard the beef industry have a bearing on tourism since the fences temper with wildlife movements (Mbaiwa & Mbaiwa, 2006). ‘In dryland ecosystems, mobility is essential for both wildlife and people to access unpredictable and spatially heterogeneous resources, particularly in the face of climate change. Fences can prevent connectivity vital for this mobility.’(Durant et al., 2015: p.545). In relation to this the interviewees had a perception that animal disease outbreaks are a threat to the tourism industry. One of the interviewees who held this view said ‘The buffalos are to blame for foot and mouth outbreaks.... , kill all the buffalos like they did in Australia’ (I1_Ene). The interviewee might have held this strong view due to recurrence of animal disease outbreaks some of which have left many farming communities impoverished. According to the

World Organisation for Animal Health (2018) confirms that to date, the only confirmed reservoir in wildlife is the African buffalo *Syncerus caffe*. Killing all the buffalos as per the interviewee's desire however may in fact work against tourism since buffalos constitute Botswana's 'big five' animals which attracts international tourists. However, previous studies elsewhere also support the view that animal disease outbreaks are a threat to economic sectors such as tourism (see Blake, Sinclair & Sugiyarto, 2003; Jensen, English & Menard, 2003). The frequent animal disease outbreaks especially Foot and Mouth Disease has resulted in the erection of veterinary cordon fences in endemic parts of the country to control the spread. Woodroffe, Hedges & Durant (2014) argue that while fences may allow some species such as lions to thrive, it may on the other hand alter the ecosystem to the extent of rendering some animal species extinct and reduce their resilience in the face of climate change.

4.2.4 Poaching

Poaching was seen as a threat in that 'poaching has increased to the extent that it may tarnish our name' (I2_Ani) meaning, that the rate at which poaching occurs may deter tourists. One policy maker (I8_Was) was even of the view that, there is need for up to date data on animal census to determine the most threatened species. Poaching targeted at these species may accelerate climate change. For example, wild grazers have been found to reduce the intensity and frequency of fires that emit greenhouse gases (Nuwer, 2019). Certainly poaching is a problem in the southern African region and northern Botswana as a target for transnational and local ivory poaching cannot be underestimated given the area's proximity to Namibia, Zimbabwe, Zambia and Angola. It is more often than not attributed to poverty especially in remote communities that do not enjoy the benefits from the local tourism economy; human wildlife conflict incidences which negate subsistence agriculture as an

alternative livelihood ; and poor land use planning (Pieters-James, 2014). The government of Botswana has therefore adopted stern anti-poaching mechanisms to safeguard the very tourist resource that tourist visits Botswana for, i.e. wildlife. These efforts indirectly contribute to curbing climate change given the role they play in ‘climate action’.

4.2.5 Poor infrastructure development

Infrastructure development was also an issue for some of the policy makers from the point of view of poor health facilities, roads, poor communication networks and lack of electricity connection in some places. One of the interviewees even lamented that ‘tourism on the Zimbabwe side is much cheaper and facilities as well as infrastructure are much better especially in Vic-falls’ (I7_Met). The interviewee went on to point out that consequently, tourists prefer to spend the nights in Zimbabwe and only cross over to Botswana for day trips. ‘Industry growth is at risk of poor internet and communication network coverage’ (I3_Tou). Notwithstanding, current improvements in accessibility has led to the increase in tourist arrivals (Hambira, 2017; Mbaiwa, 2005). The type of tourism product offered in Botswana however requires strategic infrastructure development in order to maintain its pristine form. That is, natural environments are pivotal to nature-based tourism supply and therefore any form of disturbance should be as minimal as possible.

4.2.6 Drought

Drought is one of the most common natural disasters frequently experienced in Botswana. This is because the country lies several hundreds of kilometres away from the oceans which are the

sources of moisture needed for rainfall to occur (Moses and Gondwe, 2019). Rainfall occurs mainly between October and March and is generally low with an annual mean of 250 in the southwestern part to 650 mm in the northern part which include the Okavango Delta (Moses, 2018; Statistics Botswana, 2017). The country's climate is generally described as arid to semiarid with high intra- and inter-seasonal rainfall variability (Moses, 2018). Generally, the country experiences hot temperatures (heatwaves are common) with the highest mean monthly maximum values that range between 32 to 35 °C but daily maximums can be as high as 43°C, particularly between September and March (Moses and Gondwe, 2019). These high temperatures worsen droughts by causing the little moisture available in the soil and from water bodies to be lost through evapotranspiration (Moses, Lungu & Parida, 2017). The years which were declared drought years for the whole country include 1981-1987; 1991-1999; 2001-2005; 2007-2008; 2012-2013; and 2014-2016, showing that drought has always been a challenge in Botswana (Manthe-Tsuaneng, 2014; Mogotsi, Nyangito & Nyariki, 2011; Statistics Botswana, 2017).

One of the interviewees highlighted that 'drought is now part of human life and since it is natural and climate change related, it is beyond our thinking capacity' (I2_Ani). This implied a state of despair on the part of the interviewee as to whether there is any solution to the frequent drought episodes. Another interviewee (I6_Min) further said climate change has become evident due to droughts, aridity, water shortage and food insecurity. According to Statistics Botswana (2017), temperature trend has been slightly increasing while rainfall trend has been the opposite in recent years. Prediction scenario for future rainfall over Botswana based on the Coupled Model Inter-comparison Project Phase 5 (CMIP5) indicate that rainfall will drop by about 10 to 20% from the mid- to late-twenty first century (Kirtman et al., 2013; Moses, 2018). This suggests that drought might be experienced more frequently in the future compared to the present

rate. Still based on CMIP5 projections, temperatures will increase by about 2 to 4°C particularly towards the end of the twenty first century if drastic measures are not taken against climate change. With these trends, it is befitting for the policy makers to hold the view that the status quo would affect the ecosystems and the water resources that support the wildlife that drives the tourism industry in Botswana. An increase in drought events makes the industry more vulnerable to climate change. According to the Patriot Newspaper (2019), severe drought has resulted in the drying up of wetlands such as Thamalakane River and Lake Ngami resulting in many hippos being stuck in the mud. This is due to low rainfall which has resulted in less inflow into Botswana's iconic tourist attraction, the Okavango Delta and associated outlets. This phenomenon will obviously interfere with leisure activities such as boat cruising, spot fishing and wildlife viewing.

4.2.7 Climate change and the associated fear of the unknown

As could be expected, the policy makers mentioned climate change as another threat to tourism. Several studies have alluded to this (Hambira, 2011; Saarinen, Hambira, Atlhopheng & Manwa, 2012; Scott, 2011; Simpson, 2008). The vulnerability of nature-based tourism to climate change has therefore cast doubt on whether the industry can sustain tourism led economic development (Hambira, 2017) taking into account that countries like Botswana are aiming at diversifying their economy through the industry. Interestingly drought received more emphasis from the interviewees than climate change, indicating that they did not understand that drought is just one of the extreme weather events associated with climate change.

The industry's readiness for climate change was also raised as a concern. For instance one of the interviewees highlighted that 'There is a general fear of the unknown since there is lack of consultation on how ready we are for the impending effects of climate change' (I4_Cro). This may explain why almost all the interviewees demonstrated a degree of uncertainty when asked about their views on climate change as evidenced by the following statements: 'Nobody really knows where we're headed' (I7_Met); 'It is either we adopt a low carbon development path or wait for what nature will throw at us'; 'We don't know whether it's the end of the world'(I2_Ani); 'it takes a long time for the documented evidence to provide trends that we can make sense of. However, let's plan for it and mitigate' (I8_Was); 'it is not easy to predict a wetter or drier future so let's prepare for both'(I9_Wil).

The few who displayed some level of certainty used statements such as: 'Africa is mostly on the receiving end so we should be thinking adaptation not mitigation' (I1_Ene). This interviewee however also thought worrying too much might not be necessary as 'Nature has a way of correcting itself so you never know' (I1_Ene). Other statements reflecting some level of certainty include: 'It is a serious threat to the industry' (I3_Tou); 'It is here, we have to prepare ourselves. ...It has the potential to reverse all development' (I6_Min). These were adamant that there is already evidence on the ground such as shift in seasons leading to late rains that are not evenly spread. According to the interviewees the rains bring floods and then disappear for a long time.

4.3 Policy responses and context geography to climate change as perceived by the policy-makers

The policy makers were asked to indicate the tourist attractions which would be mostly affected by climate change and what could be done to abate the situation. The protected areas (game reserves and national parks) received the most frequency of mention followed by wetlands, sand dunes and lastly cultural attractions (hills/caves and ruins).

4.3.1 Protected areas

In terms of protected areas, the interviewees were mostly concerned that wildlife viewing as a tourist activity may be affected by droughts and high temperatures. Consequently, certain species would be threatened. Some of them said, ‘Should temperatures continue to soar, there will be drastic wildlife decline’ (I9_Wil). ‘Should it become drier, the CKGR¹ will no longer exist’ (I7_Met). The strong views painted a bleak scenario of the tourism-climate change nexus. It appears the interviewees who held this view did not foresee a future for nature-based tourism in the face of climate change. This may imply that knowledge on how tourism could be resilient was lacking.

4.3.2 Wetlands

Under the Wetlands category, the Okavango Delta was the most mentioned. Reasons given by the policy makers were that the anticipated reduction in precipitation as a result of climate change will affect tourist activities such as scenic flights over the delta and wildlife viewing. One

¹ Central Kalahari Game Reserve

of them said ‘Should the delta flood, we don’t know how tourists will react, but then again should it dry up, tourists would be deterred’ (I9_Wil). This implies policy makers are calling for the availability of information on how climate change would affect tourism demand. On the same vein others were of the view that should climate change bring with it more rain, river fronts would be affected and tourists would be in danger of crocodiles. In a state of despair one interviewee said ‘too much rain would be risky as crocodiles would be everywhere’ (I3_DoT). One may view this stance as exaggerated. However such viewpoints indirectly show that inadequate information or knowledge may lead to a state of panic. Furthermore, droughts will affect pastures and wildlife numbers are bound to decline as a result hence activities such as game drives would be affected. ‘should it become drier, the delta would not remain what it is today’ (I7_Met).

4.3.3 Sand dunes and Cultural attractions

The policy makers who mentioned sand dunes, declared that even though they are not experts in the area, the sand dunes will be affected so research should be carried out to find out how. ‘Extreme heat would not allow sand dunes to be used for quad biking. Also they are not permanent structures’ (I7_Met). However another interviewee held an opposing view ‘Only sand dunes would last and possibly benefit the local economies’ (I1_Ene). With regards to cultural attractions (hills/caves and ruins), one of the interviewees had this to say ‘Rock paintings may be affected by heat’ (I1_En) while sand dunes are more likely to survive and offer alternative tourism.

4.4 Policy responses

In terms of policy responses they suggested product diversification away from nature-based tourism. Examples given were urban and mining tourism. One policy maker said ‘We must change our thinking. We must diversify by exploring what we have in the south’ (I8_Was). There have been concerns that tourist attractions in other parts of the country have been neglected and more attention was given to those in the northern part of the country with international significance. Others stressed the relevant departments must work together while others emphasised the importance of planning ahead to avoid being caught off-guard. One interviewee for instance said ‘We need to break the silos. For example, our department needs to know what tourists want in terms of food’ (I4_Cro). One reiterated that ‘There is need for a climate change communications strategy and action plans for adaptation. We need action not just talk. We should be ready for anything. Green economy is key and we must teach people to go green’ (I3_Tou). These came from the policy makers who viewed climate change to be a threat to Botswana’s tourism industry. Others even though they saw climate change as a threat to the industry, could not offer any possible solutions since they felt they were not knowledgeable enough to do so. For example one said ‘If we could predict what climate change would bring, then we would know what to do. The Department of Meteorological Services should provide us with information on what we should expect’ (I9_Wil). Others however were of the view that climate change is a natural process of which mortals could not do anything about.

From the above views of the policy makers, tourist destinations have specific economic, social and environmental characteristics (Canavan, 2016) and these more often provide the context that influences the perceptions and resultant responses to climate change by policy makers. Understanding the spatial and temporal contexts that influence people’s behavior is challenging and often muddled by various forms of uncertainty (Canavan, 2016) which is what

could have influenced the perception that there is nothing that can be done against climate change. The fact that some level of uncertainty was displayed by some of the policy makers may have also influenced this stance. This is buttressed by Brugnach, Dewulf, Pahl-Wostl & Taillieu, (2008, <https://www.ecologyandsociety.org/vol13/iss2/art30/>) who posit that 'Uncertain knowledge relationships express the specific understanding an actor has about a problem situation'. For this reason 'adaptation is likely to be a reaction to an already changed climate rather than a pre-emptive response to anticipated or projected climate change' (Schneider & Kuntz-Duriseti, 2002, p.65).

5. Conclusion

Tourism is increasingly contributing to development in the Global South and especially in rural and peripheral areas. Thus, many governments rely and invest on the development of tourism. However, the industry and specifically nature-based tourism operations are not exempt from the impacts of climate change. Decision makers therefore owe it to the current and future generations to take appropriate action. In this context, policy makers play an important role in providing solutions that would safeguard the tourism sector and its resilience in this era where climate change impacts on natural capital have been more pronounced than ever before.

There is more that still needs to be done to integrate science into policy or decision making when it comes to nature-based tourism resource base. The study revealed that proactive action against climate change by policy makers has been hampered by inadequate knowledge and learning on the subject matter. This calls for an active learning process that would lead to better adaptive capacity in the nature-based tourism industry. This is despite limitations of the

study whereby the policy makers were not asked why they held certain views hence the necessary depth in analysis is missing in a few cases. Despite this limitation, the study is crucial since it has made it clear that there is an urgent need for more engagement and knowledge sharing between policy makers and climate scientists on issues related to nature-based tourism. This would enhance economic diversification and a transition towards a more sustainable development pathway in tourism.

There is also a need to improve research on the tourism-climate change nexus future research agenda should therefore clearly address the most vulnerable tourist sites and attractions and most plausible diversification of products. It is also crucial to consider how the key ecosystems can be protected in terms of adaptation and mitigation and how to manage and govern the key resources, which would contribute towards building a more resilient tourism sector creating wellbeing for visitors and locals in future.

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