

Perceptions of tourism operators towards adaptations to climate change in nature-based tourism: the quest for sustainable tourism in Botswana

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Abstract

The effects of climate change have become increasingly evident, and have been the subject of discussion in the Southern African context recently. How climate change impacts on the tourism sector is an issue that can no longer be ignored because the industry is the mainstay of many developing economies, including Botswana. Adaptation strategies are necessary if the industry is to be sustainable and continue to benefit the host regions, communities and the tourists. This paper investigates the adaptation strategies that Botswana tourism operators have, or are planning to put in-place, in order to cope with or benefit from climate change. Surveys and interviews were conducted on local tourism operators in Tshabong and Maun. The findings indicate that most of the operators did not have any adaptation strategies in place, even though the majority believed that climate change was a reality. This led us to conclude that the industry will be reactive rather than proactive in dealing with climate change.

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Introduction

The anticipated impact of climate change on the various sectors of the economy, including tourism, cannot be disregarded. Climate and weather influence the composition and aesthetic beauty of ecosystems and natural resources upon which nature-based tourism is dependent. For a long time, climate was taken for granted by the tourism sector, until the effects of climate change such as the rising sea levels, melting ice caps, intensifying droughts, rainfall scarcity, and flood recurrence increased in frequency and affected various tourist destinations (Gössling and Hall, 2006). These occurrences have destabilized tourism products offered in the affected destinations, created risks and threatened their economic and social sustainability.

The sustainable tourism discourse is based on the Sustainable Development paradigm which was popularized by the Brundtland Commission's report known as "Our Common Future" in 1987 (Saarinen, 2006). Sustainable development calls for the utilization of natural resources along equity lines, where future generations would have equal opportunities to the resources. In other words, it is a discourse that promotes inter-generational equity for continued ecological, socio-cultural and economic benefits (Saarinen et al. 2009). Similarly, O'Riordan et al., as cited in Preston-Whyte et al. (2006), asserts that communities in tourist areas must be well established in the following issues pivotal to sustainability: wealth creation, stewardship, empowerment and revelation. That is, communities must be enabled to generate wealth through tourism while at the same time taking care of the environment upon which they depend. This can be achieved through developing their self-respect and confidence, leading to the realization that a sustainable future is attainable through collective visioning (Preston-Whyte et al. 2006). But such a vision would not be realized as long as human activities which result in the emission of Green House Gases (henceforth GHG) are not curbed.

One way of dealing with the impact of climate change is to adopt adaptation strategies that would enable communities and economies to cope with the results of climate change. The adaptation measures may be technical (e.g. rain water collection and recycling systems, access to early warning systems); managerial (e.g. water conservation plans, product and market diversification); policy related (e.g. complying

with regulations concerned with environmental protection and building codes and lobbying for the reduction in GHG emissions); research (e.g. site location in terms of slopes and elevation etc.); education (e.g. conservation education for staff and guests as well as public education campaigns); and behavioural (e.g. GHG emissions offset programmes and conservation initiatives) (United Nations World Tourism Organisation-United Nations Environment Program-World Meteorological Organisation (here after UNWTO-UNEP-WMO), 2008, as cited in Simpson et al., 2008).

As in most developing countries, the tourism sector is pivotal to Botswana's economic development. The country is semi-arid and rich in biodiversity and ecosystems that range from wetlands, sand dunes, woodlands to grasslands. These ecosystems are the impetus of the tourism industry, the second largest economic sector after diamonds. This study examines the adaptation strategies adopted by tourism operators in Botswana to determine the extent to which they are ready to deal with the impact of climate change on their operations. The study was conducted in Maun in the north-western part of the country and Tshabong (and surrounding areas) in the south-western part of the country. These were chosen because they constitute two contrasting eco-systems – Maun is a wetland and tourism hub, while Tshabong is a desert and a potential tourist attraction.

Climate change, adaptation strategies and sustainable tourism

UNWTO-UNEP-WMO (as cited in Scott and Becken, 2010) assert that climate change is the greatest challenge to sustainable tourism in the twenty first century (see also Gössling and Hall, 2006). According to Viner and Agnew (1999), the Southern African region has been warming up by 0.05°C every decade while rainfall has been decreasing steadily. They further posit that temperatures will continue to rise and will be stronger in the arid zones of Southern Africa than other parts of Africa while the effects on rainfall are uncertain. Tourists are mainly attracted to Southern Africa due to its unique landscape and wildlife diversity. According to Viner and Agnew (1999), the location of parks and reserves is based on animal distribution and climate conditions, which means that the effects of climate change such as the frequency of floods, drought, and land degradation could affect vegetation, ecological zones and, consequently, the distribution of wildlife. This would ultimately reduce the viability of recreation activities such as wildlife safaris. This scenario is likely to be an impediment to sustainable tourism.

Adaptation measures are necessary to curb negative environmental change and to promote sustainable tourism. UNDP (2004:2) define adaptation as “a process by which individuals, communities and countries seek to cope with the consequences of climate change”. Furthermore, various adaptation options are available in the tourism sector. They range from the technical (e.g. water recycling systems), managerial (e.g. water conservation plans as well as product diversification), policy (e.g. compliance with regulations), research (e.g. site location), education (e.g. conservation education for employees and guests) to behavioural (e.g. greenhouse gas offset programmes). Mather et al. (2005) suggest that governments could encourage tourism establishments to adapt to climate change by promoting traditional building designs and alternative methods of cooling; introducing man-made attractions in the face of diminishing natural attractions; passing legislation to change planning policies, changing use priorities as necessary. Traditional building designs such as thatched roofs provide natural cooling and could save more energy compared to air conditioning. Some man made attractions provide very good alternatives to natural ones if they are designed well. This could reduce the number of tourists that could be lost completely if a natural attraction loses its value. Planning and zoning policies would be informed by the anticipated effects of climate change on a given geographical area and, as such, the tourism product adopted for a particular area would be commensurate with the likely impacts of climate change. The adaption of such measures would reduce the negative and enhance the positive effects of climate change.

Nature-based tourism and climate change in Tshabong and Maun: Botswana

The study areas

The study reported in this article was conducted in Maun and Tshabong areas (see Figure 1). The former was chosen because it is one of the main tourist sites in Botswana while the latter was chosen because of its potential for the growth of tourism. Each place has unique environmental features and tourism attractions and this fact provides opportunities for the analysis of the relationship between environmental change and tourism. Maun is located next to the Okavango Delta, one of the world's largest inland deltas (Neueschwander et.al. 2002; Kgori et.al. 2006; Mbaiwa et.al. 2008). The two form an intensive tourist hub in Botswana. The tourism products available in Maun include game drives, mokoro (dugout canoe) rides, boat cruises, accommodation facilities, camping

and safaris. In contrast, the small town of Tshabong is located in the dry land ecosystem close to the Kgalagadi Trans-frontier Park (KTP), which is shared by Botswana and South Africa. Tshabong’s tourism is still in its early stages of development; that is, it is still at the exploratory stage (see Butler 1980), with the town mainly serving as a transit route to the KTP. Here tourism activity is still relatively low and characterised by low volume of travellers (see Moswete et al. 2009; Saarinen et al. 2012) compared to relatively organized and exclusive tourist segments in Maun and the Delta area (see Mbaiwa, 2005). Notwithstanding, the area has tourism potential since it is endowed with rich wildlife, sand dunes, pans and rich cultures, including those of the indigenous San communities (Moswete et al., 2009; Saarinen et al. 2012). Thus, the study was conducted in two contrasting eco-systems (see NCSA, 2000) and different tourism operation settings.

Figure1: Map of Maun and Tshabong and their tourist attractions.



(Cartographer: Mr G. Koorutwe)

Likely effects of climate change on Botswana's tourism destinations of Tshabong and Maun

The impact of climate change on nature-based tourism is dependent, to a large extent, on the ecosystem or natural environment in question. The constitution of ecosystems is influenced by, among other things, climatic conditions, geophysical conditions, dominant use by humans, surface cover, species composition as well as resource management systems and institutions (Millennium Ecosystem Assessment Board, 2003).

Tshabong sits on the plains of the aeolian sand deposits which belong to the Kalahari Beds laid down about three million years ago and averaging 100 meters thick (Johnson, 1996). Preston-Whyte et al. (2006) describe arid landscapes such as these as fragile environments in terms of their cultural heritage and biodiversity because of stresses such as desertification and climate induced changes. Midgley et al., as cited in Preston-Whyte et al., (2006) posit that in South Africa, warmer and drier conditions emanating from climate change may be bad news for tourism as they do not favour plant and animal diversity that are attractive to tourists. This may apply to Botswana since it has similar ecological and climatic characteristics, hence related impacts (Anderson et al. 2006; Milzow et al. 2010).

Maun's tourism products are mainly anchored on the integrity of the Okavango Delta. Folwell and Farquharson (2006) employed the Global Water Availability Assessment (GWAA) model to determine how water availability in the Okavango Basin would be affected by climate change and growing demand. The model predicted changes in precipitation and potential evaporation, showing a decrease in precipitation and increase in potential evaporation across the basin monthly. They, however, concluded that there was still considerable uncertainty in general climate models at present, even for the scale of the Okavango basin. The above likely effects of climate change on the two study areas makes the natural capital upon which tourism is dependent vulnerable to climate change and hence the need to use adaptation strategies that would mitigate the effects of climate change and lead to sustainable tourism.

Materials and methods

A survey was conducted in tourism businesses in Tshabong area and Maun in 2009 to find out the operator's perceptions regarding climate

change and the effect it might have on their businesses. The purpose was to establish whether tourism companies had any adaptation strategies aimed at mitigating the effects of climate change. The survey questions were used to elicit information about the background of the business and the tourism business operator. The survey also covered issues relating to climate change, tourism benefits and climate change adaptation. The responses to the statements were arranged in a fivefold Likert scale *viz*: strongly agree; agree; neither agree nor disagree; disagree; and strongly disagree. On the other hand, the Likert categorization for adaptation strategies was as follows: in place; planned currently; planned to do but failed; not a necessary strategy; and no opinion. The operators were also interviewed in order to substantiate the information derived from the surveys.

Convenience sampling was used to select tourism-related businesses. In the case of Tshabong, out of seven known tourism related businesses, six were contacted and all were accommodation facilities; two camping facilities (one in Werda and one in Tshabong), a lodge, two guest houses and a motel. In the case of Maun, out of a total of 135 tourism establishments survey forms were distributed to 26, out of which 22 responded. Of the 22 establishments that responded, ten were accommodation facilities, six were safari companies, four were curio (crafts) shops, one was a flying safari and one classified itself as an ecotourism business.

Due to the small number of businesses surveyed, the analysis is largely descriptive. The operators were presented with statements to respond to regarding their perception of the impact of climate change on their regions, their operations/businesses, and the sustainability of the tourism industry. The respondents had to choose from the following response options: 'agree' and 'strongly agree'; or 'disagree' and 'strongly disagree'. The responses to statements pertaining to adaptation strategies in place were divided as follows: 'in place', 'planned', 'not necessary' and 'no opinion'.

Even though the main aim of the study was to find out if the tourism operators had any adaptation strategies in place to cushion the effects of climate change, their responses were dependent on their perceptions regarding climate change; that is, whether they believed it exists and would impact their operations; and whether they perceived tourism in their regions to be sustainable, bearing in mind climate

change issues. The responses were analysed and interpreted by taking into consideration issues of climate change and tourism nexus, climate change adaptation strategies in the tourism sector and sustainable tourism as highlighted in the preceding sections of this paper.

Survey results

The main results of the survey are reflected in the following sub sections and the corresponding tables.

Tourism Operators' perceptions on the impact of climate change on the local environment and the tourism industry

Operators' perceptions of the effects of climate change on the local environment and the tourism industry are addressed in four statements: that climate has recently changed in the region; that climate will change in future in the region; that recent temperatures and rains have been normal; and that climate change will reduce the attractiveness of the region in future. The results are reflected on Table 1.

In the Tshabong area, of the six operators who participated in the study, four agreed with the statement that 'climate has recently changed in the area' while two were of the view that it has not changed. There were five operators in Tshabong who responded to the statement that 'climate will change in future in the region'. Of the five, four were positive that climate was bound to change in future. Regarding the statement that 'recent temperatures and rains have been normal', only two respondents agreed with the statement. On the statement that 'climate change will reduce the attractiveness of the region in future', four of the respondents were certain that it would.

The perceptions of operators in Maun are also reflected in Table 1. Of the 22 operators, 19 were of the view that climate had recently changed in the region. Similarly, 16 believed that climate would change in the future. On the statement of temperatures and rains having been normal, six believed they had been normal while 13 did not believe so. With regards to climate change reducing the attractiveness of the area in future, 11 were affirmative, while six were negative.

Table 1: Operators’ perceived impact of climate change on the local environment in Tshabong area and Maun Village, Botswana

Statements	Affirmative R(%)		Negative R(%)		Neither affirmative Nor negativeR(%)		Total respondents R(%)	
	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22
Climate has recently changed in the region	4 (67)	19 (86)	2(33)	2 (9)	0 (0)	1 (5)	6 (100)	22 (100)
Climate will change in future in the Region	4 (67)	16 (73)	0 (0)	0 (0)	1(17)	4 (18)	5(83)*	20 (91)*
Recent temperatures and rains have been normal	2 (33)	6 (27)	2(33)	13 (59)	2 (33)	2 (9)	6 (100)	21 (95)*
Climate change will reduce the attractiveness of the region in future	4 (67)	11 (50)	2 (33)	6 (27)	0 (0)	5 (23)	6 (100)	22 (100)

*some of the respondents abstained. NB: R for respondents; Tsh for Tshabong; Mau for Maun

Table 2 shows the operators’ perceptions on what effects climate change may have on tourism in general, and on their business operations in particular. Operators were asked to respond to statements regarding how the tourism industry and their operations were likely to be impacted by climate change. Furthermore, some statements sought their awareness of the effects of climate change and whether investment in adaptation by operators was warranted.

In Tshabong, the majority of operators reported that they believed that climate change would impact the country’s tourism sector. However, regarding the statement that climate change would not impact their operations; three agreed that their businesses would not be impacted by climate change; two were of the view that it would, while one was indifferent. Further, two of the operators admitted that they were ignorant of the impact that climate change would have; the same number claimed knowledge of the impact of climate change and one was undecided. Only five operators responded to the statement about their knowledge of the likely impact of climate change. Regarding the statement about investment on climate change adaptation, almost all the respondents were of the view that the tourism industry should invest in climate change adaptation strategies now; only one was indifferent.

The Maun operators’ perceptions as far as the statement ‘climate would impact on the tourism industry’ did not differ from those of Tshabong operators in that the majority of operators, 19 out of 22, affirmed that indeed climate change would impact the tourism industry.

On whether climate would not affect their operations, Maun differed from Tshabong in that half of the operators did not believe that their businesses would not be affected while six believed that they would not be affected. Another result which differed from Tshabong was regarding the knowledge of the impact that climate change would have on their operations, as 13 respondents admitted that they did not know what climate change would bring; six said they knew while two were unsure. One of the operators did not respond to the statement. Sixteen (16) operators in Maun were of the view that the tourism industry should invest in adaptation strategies immediately; four did not believe that they should while one did not respond to the statement. This differed from Tshabong where no operator supported investing in adaptation immediately, only in the future.

Table 2: Operators’ perceptions on the impending effects of climate change on their tourism operations in Tshabong area and Maun Village, Botswana

Statements	Affirmative R (%)		Negative R (%)		Neither affirmative Nor negative R (%)		Total respondents R (%)	
	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22
Climate change will impact tourism industry	4 (67)	19(86)	2 (33)	1 (5)	0 (0)	2 (9)	6 (100)	22 (100)
Climate change will not impact on my business operations	3 (50)	5 (27)	2 (33)	11 (50)	1 (17)	4 (18)	6 (100)	21 (96)*
I (respondent) do not know what impacts climate change will bring	2(33)	13 (59)	2 (33)	6 (27)	1 (17)	2 (9)	5 (83)*	21 (96)*
The tourism industry should invest on adaptation now	5 (83)	16 (73)	0 (0)	4 (18)	1 (17)	1 (5)	6 (100)	21 (96)*

* One of the respondents did not respond to that statement: NB: R for respondents; Tsh for Tshabong; Mau for Maun

Perceptions on the sustainability of benefits accruing from tourism

Table 3 provides an overview of the tourism operators’ opinions on the sustainability of benefits accrued from tourism and the industry’s future growth. The operators’ perceptions were gauged using statements that determine tourism benefits to communities, limits associated with tourism development, contribution of tourism to poverty reduction and the impact of tourism on the local environment. For the nature-based tourism industry to be sustainable, and to ensure its continued growth,

it must benefit the local communities within which it is based and also maintain the integrity of the environment which provides the basis for its existence. The results are summarised in Table 3.

In the Tshabong area, the majority of the operators (five) were of the view that tourism greatly benefits the local community. Furthermore, three disagreed that there were currently no limits to tourism growth in Tshabong while two were indifferent. As could be expected in an area that is still trying to find its footing in the tourism industry, the majority of the respondents did not believe that the tourism industry could result in low levels of poverty in Tshabong. Lastly, half of the operators disagreed with the notion that tourism has a negative impact on the local environment compared to two who agreed that indeed tourism has a negative impact on the local environment.

In Maun, almost all respondents concurred that tourism greatly benefits the local community while only one disagreed. Similarly, most of them believed that currently there are no limits to tourism growth in their area while four disagreed. On whether poverty levels in the study area are lower due to tourism industry, almost half of Maun operators believed so. Regarding the statement that tourism has a negative impact on the environment, only four operators concurred with the statement, nine of them did not believe so while the remaining eight were indifferent.

Table 3: Operators’ perceptions on the benefits and sustainability of tourism in Tshabong and Maun

Statements	Affirmative R (%)		Negative R(%)		Neither affirmative Nor negative R (%)		Total respondents R(%)	
	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22	Tsh N=6	Mau N=22
Tourism greatly benefits the local Community	5 (83)	95.5	1 (17)	4.5	0 (0)	0	6 (100)	100
Currently there are no limits to tourism growth in the study area	1 (17)	68.2	3 (50)	18.2	2 (33)	69.1	6 (100)	95.5*
Poverty levels in the study area are lower due to tourism industry	0 (0)	45.5	4 (67)	22.7	2 (33)	27.3	6 (100)	95.5*
Tourism has a negative impact on the local environment	2 (33)	22.7	3 (50)	40.9	1 (17)	36.4	6 (100)	100

* One of the respondents did not respond to that statement: NB: R for respondents; Tsh for Tshabong; Mau for Maun

Table 4 shows responses to the question of what, if any, adaptation strategies had been put in place, planned for, or not perceived as a necessary undertaking by the tourism operators in Tshabong and Maun area respectively. The strategies are divided into the following categories: policy, managerial, educational, technical and behavioural. With respect to the policy adaptation measures, three and 13 operators in Tshabong and Maun respectively said they had implemented such. In Maun, one operator did not find it a necessary strategy while two had no opinion. Only a few operators had implemented managerial adaptation strategies in the two study areas, while three and six were still planning to in Tshabong and Maun respectively. In both Maun and Tshabong, there were some operators who did not believe that it was necessary to put in place any managerial adaptation strategies. Educational adaptation strategies were reportedly implemented by about half of the operators in both Tshabong and Maun. One operator in Tshabong said he did not find it necessary to put in place an educational adaptation strategy while five operators in Maun chose not to make their opinion known. Half of the operators in the two towns had technical adaptation strategies in place. For the behavioural adaptation strategies, only one operator had implemented such in Tshabong area and almost half in Maun while half of Tshabong operators were planning to put them in place in the future compared to only three in Maun.

Table 4: Adaptation strategies put in place or planned by tourism operators in Tshabong area and Maun Village, Botswana

Adaptation categories	In place R (%)		Planned R (%)		Not necessary R (%)		No opinion R (%)		Total R (%)	
	Tsh N=5**	Mau N=22	Tsh N=5	Mau N.22	Tsh N=5	Mau N=22	Tsh N=5	Mau N=22	Tsh N=5	Mau N=22
Policy	3 (60)	13 (59)	2 (40)	4 (18)	0(0)	1 (5)	0 (0)	2 (9)	5 (100)	21 (96)*
Managerial	1 (20)	6 (27)	3 (60)	6 (27)	1 (20)	4(18)	0(0)	6(27)	5 (100)	22(100)
Education	3 (60)	11 (50)	1(20)	5 (23)	1(20)	0(0)	0(0)	5 (23)	5 (100)	21 (96)*
Technical	3 (60)	11 (50)	0(0)	2 (9)	1 (16)	6 (27)	0	3 (14)	4 (80)*	100
Behavioural	1 (20)	10 (46)	3 (60)	3 (14)	0(0)	2 (9)	1 (16)	5 (23)	5 (100)	21 (96)*

*One of the respondents did not respond to the statement, **One of the operators did not respond to this section of the survey form completely. NB: R for respondents; Tsh for Tshabong; Mau for Maun

Implications of the findings for a sustainable tourism industry

In general, the majority of the operators in both Tshabong and Maun agree that climate has recently changed in their regions and that the change is bound to continue into the future as evidenced by the recent changes in atmospheric temperatures, which have become warmer,

and rainfall, which has become more erratic. The operators were of the view that this scenario would ultimately reduce the attractiveness of their regions. Even though some tourism operators in both study areas admitted that they were not aware of the nature of the impact of climate change, most believed that it would impact the tourism industry in general and ultimately, their own operations. For that reason, many believed that adaptation strategies should be put in place immediately. This shows that a considerable number of operators consider climate change to be an important factor in the sustainability of the tourism industry, and that it was necessary to put in place measures that would reduce its impact on their operations.

Most tourism operators in Tshabong and Maun believed that tourism greatly benefits the local communities but surprisingly, they did not believe that poverty levels had gone down as a result of the tourism industry. This may be due to the fact that most did not see tourism as the main source of livelihoods in their areas. According to Tao and Wall (2009:90), “when tourism is introduced into a community, it is important that it complements rather than displace existing activities”. The Tshabong community is thus involved in other livelihood strategies, mainly farming. This may explain why tourism in this area is yet to be fully explored and its benefits are not yet visible. In addition, most operators believe that there are limits to the industry’s growth in the area. This implies that many locals are probably not aware of the tourism opportunities, or, if they know, they find it difficult to get involved and participate in it.

In contrast, the industry is well developed in Maun. However, it is mainly controlled by foreign operators and thus excludes locals (Mbaiwa, 2003). As a result, locals are engaged in other livelihood activities such as farming and informal jobs. Glasson et al., (as cited in Mbaiwa, 2003), posit that dominance of the industry by foreign investors can reduce local control over resources and this may result in long term negative impacts on tourism. Still in Maun, most operators believed that there are no limits to tourism growth in their area. This perception may be influenced by the many tourism opportunities available here compared to what is available in Tshabong, and by the fact that the tourist attractions in that area are more internationally acclaimed than those in Tshabong. In addition, the industry in Maun is probably still in Butlerian development phase which is characterized by optimism concerning growth and opportunities as well as a certain level of understating the negative impacts of the growing industry (see

Butler 1980).

The factors discussed above and the fact that operators did not associate the reduction in poverty levels with tourism in both areas may impede the realization of sustainable tourism which requires that communities benefit from the resources that are part of their livelihoods. Contrary to the perception by most operators that the industry does not have any negative effects on the environment, Mbaiwa (2009) outlines the following environmental effects: destruction of vegetation, noise, pollution, impacts on sanitation systems and water resources as being prevalent in the Okavango Delta (Maun) though at a small scale.

Regarding adaptation strategies for the sustainability of the industry, the policy adaptation strategies that operators had in place were mainly in compliance with government regulations. That is, they were not driven by deliberate internal policies that would mitigate the effects of climate change on their operations. Managerial adaptation strategies were deficient in terms of product diversification, and few facilities had water conservation programmes such as recycling. In education, most operators were doing considerably well in terms of conservation awareness for staff, but deficient in research that would fill their knowledge gaps on issues of tourism and climate change. On technology, most operators regulated hot and cold temperatures through the use of air conditioners which many had installed, not necessarily because of concerns about climate change, but because these two areas are very hot in summer and cold overnight in winter. Lastly, on behavioural adaptation strategies, operators mostly concentrated on water conservation programmes and were deficient in programmes that could offset GHG emissions. This shows that the operators can still do more in terms of climate change adaptation.

Conclusion and recommendations

In respect to global climate change and its local impacts, the adaptation practices in tourism operations are evolving while decisions made and directions selected have long term impacts on the environment and the viability of the industry. Therefore, in order to nurture and improve its sustainability and socio-economic responsibility, the tourism industry in Botswana should be proactive in investing in climate change adaptation. The study has shown that the industry will not escape the impacts of climate change, as operators indicated that they were aware of changes in temperatures and rainfall patterns in recent years. Adaptation is imperative for a country like Botswana, whose current

dependence on mineral resources makes it mandatory to pursue alternative economic drivers. In addition, sustainable tourism would be ensured since the environment upon which nature-based tourism is anchored would be conserved, tourism as an economic sector would continue to enjoy the natural capital, and community livelihoods would be enhanced as the benefits accrued from tourism trickle down to them. Having demonstrated that the impacts of climate change differ from one geographical location to another, it is important that further research be conducted at different locations in Botswana to determine how the various ecosystems and the tourism sector are bound to be affected by climate change, and how the findings could be upscaled to the district or country level in order to better inform adaptation pathways.

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