Wildlife-based Tourism and Climate: Potential Opportunities and Challenges for Botswana

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Abstract

Tourism plays a major role in boosting the economies of most developing countries in Africa. Many African countries have begun to realize the limited successes of agricultural exports due to anthropogenic climate change and developmental pressures and have so far shifted their focus to tourism as a new source of growth. Nature-based tourism has become the most popular land-use tool, and a rural-development strategy in southern Africa, in particular Botswana, where it has contributed to job creation, income generation and promoted the conservation of natural resources and improved living standards of remote-rural area communities. This chapter aims to build/add knowledge and understanding of the effects of climate change on nature (e.g., wildlife) and highlight the relationship between wildlife resources in general and the climate-related risks to Botswana's lucrative nature-based tourism industry in particular. The paper has identified and discussed the likely impacts of climate on natural resources and how this will have negative effects on the wildlife/safari tourism. The paper concludes by discussing existing opportunities for diversifying the tourism-product base for Botswana away from sole dependence on wildlife resources to a form of tourism with nature and culture combined. Recommendations include the creation of well-rounded, all-year tourism packages that incorporate both wildlife and cultural tourism.

Introduction

The economy of Botswana has prospered for more than 40 years on mineral-based natural resources. Between 2001-2005 diamonds and copper-nickel accounted for an average of 86% of the country's total exports (Jefferies, 2009). While Botswana is deemed a middle-income country, it is sparsely populated with only 2 million people within a land surface area of 581,730km2); it is semi-arid, with 80% of the surface area under the Kalahari Desert; and a land-locked country, dependant on a single non-renewable commodity (diamonds), in a region where more than half of the countries fall under the world's poorest nations known as Least Developed Countries (LDCs) (SADC, 2008). This makes Botswana particularly vulnerable to global-market pressures and the indicated impacts of climate change. The growing pressure to diversify the economy is turning the focus to tourism, in particular nature-based tourism, which currently is one of Botswana's fastest-growing economic sectors (Government of Botswana, 2001; Knowles & Theron, 2010) and is considered to be a more sustainable economic option; however, a purely nature-based tourism industry may become unattainable in the future due to a combination of population and development pressures plus anthropogenic climate change. Land degradation and increased drying, leading to a decrease in mammal

populations, are likely to reduce the attractiveness to the country's natural landscape and make wildlife tourism less viable (Dube & Kwerepe, 2000; Dube & Moswete, 2003).

This chapter aims to build the knowledge and understanding of the effects of climate change on nature (e.g., wildlife), and highlight the relationship between wildlife-based tourism resources in general and the climate-related risks to Botswana's lucrative nature-based tourism industry. The chapter also discusses the existing opportunities for diversifying the tourism product base for Botswana away from sole dependence on spectacular wildlife and scenery as attractions to other forms of tourism.

A review of the status of tourism in Botswana follows this introduction after which the likely impacts of climate change and other stressors on Botswana's wildlife resources. The last section attempts to provide alternative avenues to reduce the negative impacts of climate change on the tourism industry in the future.

Tourism in Botswana

Tourism is the second largest economic sector in Botswana (after mining) and is recognized as a major stimulus to the economy (BTDP, 2000; GOB, 2001, WTTC, 2007). The industry has been growing steadily throughout the years as evidenced by the number of visitors, which grew from 106,800 to 203,172 between 1993 and 1998 (Central Statistics Office CSO, 1998; 2003). An increase in visitors was observed in 2005 when the number approached that of the total population of Botswana (DOT, 2006; WTTC, 2007). The number of foreign investors in the tourism business has also increased from 331 in 2000 to approximately 550 in 2004 (Botswana Review, 2005).

About 90% of tourists who come to Botswana visit National Parks and Game Reserves (Magole & Gojamang, 2005; WTTC, 2007). Also, about 90% of Botswana tourists listed wildlife-related tourism activity, especially in Chobe and Moremi Game Reserves as the greatest attraction (Magole & Gojamang, 2005). Approximately 40% of the country is designated as national parks and game reserves, and 22% of this has been set aside as Wildlife Management Areas (WMA) (GOB, 2003) (**Figure 1**). It is in these protected areas that wildlife-based tourism (photographic safaris, trophy hunting and filming) is mostly practiced (GOB, 2001; 2003), and many long-haul tourists visit Botswana to see charismatic species, including the Big Five (**see Table 1**); however, wildlife-based tourism and eco-tourism is not restricted to protected areas.

Table 1. Number of large mammals in the Okavango Delta in 2002, calculated for an area of 20,000km2 derived from ten aerial counts carried out in 1988-2002 by DWNP, Government of Botswana (Bonyongo, 2004). Numbers of impala have been corrected on ground counts (Ramberg et al., 2006 p329).

Species	**Total number**
Elephant, *Loxodonta Africana*	35,000
Zebra, *Equus burchelli*	14,000
Warthog, *Phacochoerus aethiopicus*	2,000
Hippopotamus, *Hippopotamus amphibious*	2,500

Giraffe, *Giraffa camelopardalis*	5,000
Wildebeest, *Connochaetes taurinus*	8,000
Tsessebe, *Damaliscus lunatus*	3,000
Impala, *Aepyceros melampus*	140,000
Buffalo, *Syncerus caffer*	60,000
Kudu, *Tragelaphus strepsiceros*	300
Sitatunga, *Tragelaphus spekei*	500
Red Lechwe, *Kobus leche*	60,000

Note: Department of Wildlife & National Parks.

Wildlife-based tourism plays a significant economic role and contributes 70% of all Protected Areas (PAs) revenues to the total national economy (Gujadhur, 2001; WTTC, 2007). Primarily, commercial utilization of wildlife resources has been practiced via non-consumptive means, mainly in PAs, including Wildlife Management Areas (WMAs). In 2000, wildlife/safari-hunting activities generated about US$12.5 million (Arntzen, 2003). The industry has been growing in leaps and bounds in the past ten years as evidenced by growth in commercial lodging facilities (hotels, safari lodges and built campsites), and other infrastructural development in urban and rural towns/villages.

NG 31 Controlled Hunting Area, Okavango area. Photo by Naomi Moswete (September 2011).

Wildlife-based tourism is also considered as the most appealing form of land use in the country (Barnes, 2001; GOB, 2002; 2007; MFDP, 2009), as the major activity of safari hunting occurs in remote parts of the country, which creates jobs for rural communities where poverty levels are high. Trophy-animal hunting (e.g. elephant or buffalo) accrue high revenue for safari hunters and provide income for the rural resident communities (Gujadhur, 2001; Mbaiwa, 2003; 2008; Thakadu, Mangadi, Bernard et al., 2006). In all, wildlife-based tourism has been centered in and around the Okavango Delta and Chobe National Park, accounting for about 95% of visitations and 91% of revenue for all park-based eco-tourism activity in 2006 (WTTC, 2007).

There is growing concern about nature-based tourism as more evidence signals that changes in climate due to human activities may have a significant impact on natural resources globally (Alley et al., 2007; Becken & Hay, 2007). For example, the effect of the flooding in the Okavango Delta in 2000 resulted in the closure of the Moremi Game Reserve for a period of eight months because roads were impassable. During that period, there was a decline in the number of self-drive tourists in the Okavango Delta and tourism revenue went down (Mbaiwa & Mmopelwa, 2009). This might have had a direct impact on local livelihoods since the majority of the workers in tourism facilities are local

people. The section below explores potential impacts of climate change on Botswana's wildlife resources, which may have implications for the sustainability of tourism in the country.

CLIMATE CHANGE AND WILDLIFE RESOURCES IN BOTSWANA

Expected Impacts of Climate Change

Indications are that impacts of climate change in southern Africa, where Botswana is located, will not be uniform. For instance, more drying is expected toward the west, with negative implications particularly on wildlife, which is currently the major tourist attraction in Botswana (**Table 2**). Work by Thuiller et al. (2006) identified the region centered on the Kalahari in arid Namibia, northern South Africa and Botswana as the second most likely (after central Africa) to experience significant wildlife species losses due to climate change. Similar predictions for Botswana were noted in Hulme (1996). This is because climate scenarios signal greater warming and drying throughout the western parts of southern Africa (**see Table 2**).

Table 2. Indicated future effects of climate change.

• The central-southern Africa landmass, which extends over Botswana, parts of north-western South Africa, Namibia and Zimbabwe, is likely to experience the greatest warming of 0.2°C to 0.5°C per decade. For Botswana, MWTC (2001) estimates are in the range of 1 to 3°C during the next 100 years. Because of the slow response of the oceans, further warming in the next two decades of about 0.1°C per decade is expected globally even if the concentrations of all GHGs and aerosols had been kept constant at year 2000 levels.
• Overall, the number of warm spells is likely to increase in the region, with a decrease in the extremely cold days (and these have already been observed in Botswana).
• An increase in rainfall variability and extreme events and a decrease in the growing season have been indicated and also observed from station data. Climate scenarios point to a potential for greater drying in western parts of southern Africa. Greater drying of the range of 30 to 40% throughout the winter season, June to August, has particularly been noted.
• More intense droughts are likely due to a number of factors, including the warming of the Indian Ocean and potential linkages between global warming and changes in patterns of El Niño/Southern Oscillation, which is known to influence climate variability in the region.
Sources: Becken & Hay, 2007; Desanker et al., 2001;Hulme, 1996; Hulme et al., 2001; Ministry of Works, Transport and Communications(MWTC), 2001; Scholes and Biggs, 2004; MFDP, 2009; Alley, et al., 2007; Boko et al., 2007; Christensen et al., 2007; Funk et al., 2008).

Climate Change and Wildlife Resources

As noted above, wildlife is the major source of tourism attraction in Botswana. Climate change will likely affect wildlife resources in Botswana in multiple ways, depending on the status and management of these resources. A recent aerial survey over the Okavango Delta concluded that wildlife species have shrunk in the past 15 years, reaching in by as much as 95% for ostrich, 90% for wildebeest, 84% for antelope tsessebe and 81% for warthogs and kudus; although others, such as elephants and plains zebra, remained stable while hippos increased by 6% (Guardian-UK, 18th June 2011). The results are, however, based on a one-off aerial survey and need to be interpreted with caution, although others have signaled similar trends (see Perkins & Ringrose 1996; Rudee, 2011). A number of interactive factors, among which are drought, fires, habitat fragmentation and encroachment and poaching, are noted to contribute to population decline (Knight, 1995).

Wildlife is generally adapted to climate variability that is characteristic of Botswana's semi-arid environment where annual rainfall ranges from 200 to 600mm (Parida & Moalafhi, 2008). However, increasing evidence points to significant departure from the normal climate variability characteristic of southern Africa (**Table 2**). Droughts experienced since the 1970s for instance, 1983 to 1987 and 1991/92, have been linked to anthropogenic climate change, particularly changes in patterns of El Niño/Southern Oscillation phenomenon and the warming of the Indian Ocean (Desanker, 2001; Boko et al., 2007; Funk et al., 2008).

Prolonged climate-change-induced dry spells in Botswana may reduce moisture and nutrient content of forage. Most wildlife is physiologically adapted to arid conditions, for instance, in times of water scarcity springbok can meet their water needs from forage (Stapelberg et al., 2008), but there are limits to these coping mechanisms. Projections of increased dryness throughout the winter months (Christensen et al., 2007) will limit further availability of green forage in periods of great need (**see Table 2**). In South Africa, nearly all ungulate species in Kruger National Park (KNP) were observed to be extremely sensitive to a lack of rainfall during the dry season (Thuiller et al., 2006). Similarly, Raseroka (1975) linked the disappearance of buffalo in the southern parts of Botswana to the drying and loss of forest vegetation along the Molopo and Limpopo River systems. While mass mortality in Kalahari wildlife in 1985 was linked to the cumulative effects of droughts that persisted since 1977 (Knight 1995) and as noted in **Table 2**, these droughts were partly driven by climate change.

Several studies have pointed to a change in vegetation structure of Botswana and much of southern Africa in which few woody species, such as acacia tortilis (mosu) and melefera (mongana), grewia bicol (moretlwa), dichrostachys cinerea (moselesele), dominate the rangelands. Previous studies have linked this to degradation of rangelands during the dry periods and change in fire regimes (Dube & Kwerepe, 2000; Reynolds & Stafford-Smith, 2002). But recently these changes have been linked to a gradual shift to a drier and warmer climate in addition to an increase in CO2 in the atmosphere, which may favor woody plants (Bond, 2003; Dube, 2003).

Such changes have implications for wildlife habitat structure and dietary supply. When combined with projected/likely shortages of water and rising temperatures due to climate change, particularly in the western parts of the region that include Botswana where these conditions could be severely felt in future, this will most likely affect breeding patterns and wildlife species composition in a way that has not been witnessed before (Hulme, 1996; Thuiller et al., 2006). Rudee (2011) noted a loss of compensatory breeding among springbok in Botswana that currently cannot be accounted for and is suspected to be a factor in the abnormally low rate of natural increase in the Kalahari. Springboks breed seasonally with a short six-month gestation period and can give birth twice a year and this is what is referred to as compensatory breeding, a form of adaptation enabling the springbok to recover quickly in cases of population declines (Skinner & Moss 2004).

Wildlife is widely known to cope with spatial and temporal variability of water and nutrient availability through migration and dispersal (Dube & Moswete, 2003). The seasonal migration of wildebeests in search of surface water and more nutritionally rich forage extended to 200,000km2 throughout the Kalahari (Williamson et al., 1988; Child et al., 1971). Fragmentation of wildlife habitats and existence of barriers, such as veterinary fences and human settlements, have severely reduced this coping strategy, increasing vulnerability to human pressures and climate change.

Thuiller et al. (2006) noted a potential eastward species shift in line with the projected west-east temperature and precipitation gradients in the region that may result in the northeastern South Africa and adjacent southern Mozambique areas experiencing an increase in wildlife species richness of 50% and 80% for A2 2050 and A2 2080 time slices and climate change scenarios respectively. Western areas, including Botswana, will record losses and changes in species composition as wildlife shift to cooler and wetter areas. For example, Hulme (1996) noted that the Okavango Delta may be less favorable for elephants by 2050 but more attractive to species, such as giraffe and warthogs, as the area gets drier. However, wildlife survival options under the projected changes will be obstructed by inability to migrate first within a country and worse for the case of between countries, due largely to human-made barriers. West-east temperature and precipitation gradients also imply a potential shift in cultivation and general human population to more conducive climate, which will not favor flourishing wildlife, except in cases of direct-management interventions. Thuiller et al.'s (2006) study found that out of the 277 African mammalian species assessed for impacts of climate change, none were committed to extinction where there was unhindered migration, but a maximum of ten species faced extinction by 2080 under the A2 HadCM3 scenario in the case of constrained migration (Thuiller et al., 2006).

Veterinary fences are a common feature in Namibia, South Africa and Zimbabwe and combined with international-border fences have a negative effect on wildlife movements, although efforts are being made to establish trans-boundary conservation areas (for example, the Great Limpopo Transfrontier Park, which shares borders and management with Mozambique, South Africa and Zimbabwe (Peace Parks Foundation, 2003; Ramutsindela, 2007)). In Botswana, veterinary fences date back to before independence

and have continued to expand despite the declining role of the livestock sector in the GDP, i.e. from more than 40% in 1968 to less than 2% in 2006 (Hillbom, 2008).

Wildlife in the south, central and western parts of Botswana are cut-off from the more wet areas of the north that include the Okavango Delta, Makgadikgadi systems and Chobe-Kasane area by the Kuke Fence erected between 1954 and 1958 (**Figure 1**). The Kuke fence runs from the Namibian border in the west across to the northern boundary of the Central Kgalagadi Game Reserve (CKGR) where it is joined by the Phefodiafoka-Kuke Fence, which then extends to the Dibete/Lephepe/Kaka veterinary fence, which runs to the border with South Africa in the east (Mbaiwa & Mbaiwa, 2006). Wildebeest die-offs in 1964, the 1970s and the 1980s droughts at Lake Xau have been linked to constrained migration to perennial water sources caused by the Kuke Fence (Child, 1972).

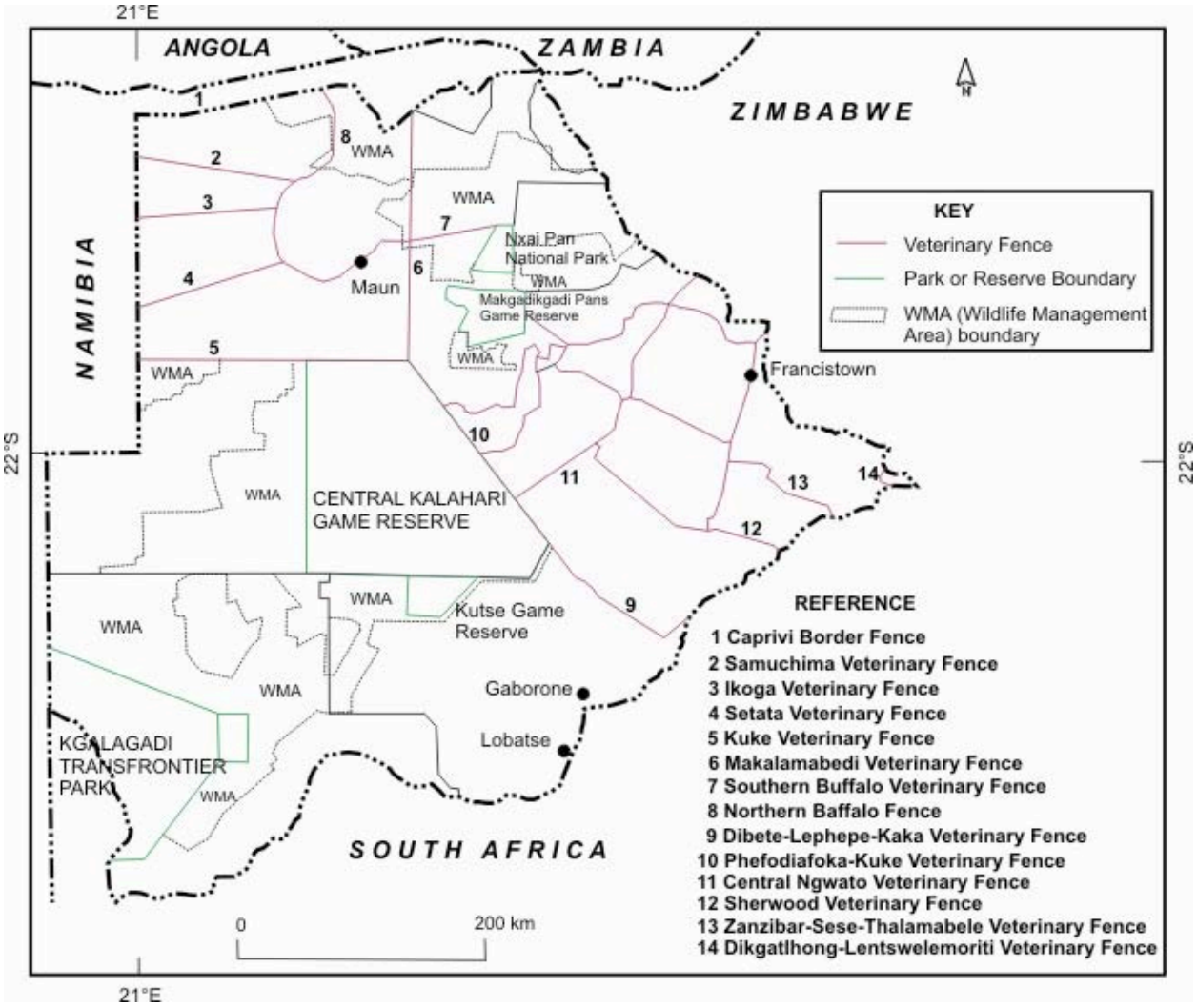

Figure 1. Map of Botswana. National Parks and Game Reserves (created by G. P. Koorutwe).

Note: WMA – Wildlife Management Areas.

Interventions have been made by the government to minimize the effects of drought on wildlife, by providing water pumped from boreholes for instance; however, most of Botswana's underground-water reserves are fossil resources that cannot be sustained for long-term water needs. Campbell and Child (1971) and van Vegten (1981) have raised concern on the drop-in water levels of aquifers in Botswana. Beekman and Xu (2003) have estimated that underground recharge in southern Africa is at 1% or less of the mean annual rainfall, far lower than the current rate of extraction.

The water situation will worsen with rising temperatures due to global warming elevating evapo-transpiration leading to rapid losses, i.e. evapo-transpiration rates increase by approximately 3 to 4% for every 1°C rise in temperature (Du Pisani & Partridge, 1990; Schulze et al., 1995). Using the core scenario, Hulme (1996) estimated that potential evapo-transpiration in the Okavango Delta might increase by 15% by 2050 resulting in a decrease in runoff of about 20%. These changes will intensify already experienced water shortages and demand competition with negative consequences on both humans and wildlife (Dube, 2003).

Periods of exceptionally high rainfall in between dry spells due to increased climate variability will provide conditions conducive for build up of biomass and the spread of invasive species. Accumulated biomass combined with hot temperatures, low humidity and windy conditions under climate change will increase fire risk (Dube, 2007). Wild-land fires are common in Botswana, affecting most wildlife areas during dry seasons following wet seasons. The total area affected by fire estimated from satellite data in 2006, 2008 and 2010 was approximately 5.7 million, 11.8 million and 13.6 million hectares respectively (DFRR, 2011). A decline in wildlife, especially reduction in large herbivore biomass in the Kgalagadi system, has been noted to be a factor contributing to biomass accumulation leading to fires (Perkins et al., 2002).

Reduced wildlife migration and dispersion in dry periods may contribute to the degradation of resources in concentrated wildlife areas, such as the destruction of woodland by the large concentration of elephants in the Chobe district of northern Botswana (Hulme, 1996). Severely degraded areas tend to support fast-growing and more flammable vegetation species when rains return, which fuels wild-land fires, thus reinforcing the negative effects of climate-change-driven changes on wildlife habitats and dietary needs. Nearly 90% of fire ignitions are caused by humans, indicating that there is a chance to reduce burning where concerted efforts are made to engage communities and invest in fire management (Dube & Mafoko, 2009).

In addition to the above, another threat on wildlife linked to climate change is unprecedented disease outbreaks. The dynamics of wildlife diseases are generally not much understood in southern Africa. Disease outbreaks due to changes in temperature, rainfall and humidity will particularly be a threat under restricted migration. Hulme (1996) noted that ticks in the Okavango Delta will multiply by 2050 when temperatures increase by 1.5°C. The tick Boophilus decoloratus larvae was observed to peak twice in the same year in southern Kruger National Park (KNP) after an unusually warm winter in 1998, indicating the role of climate in the lifecycles of ticks or other parasites, which has

negative implication for wildlife (Thuiller et al., 2006). In Uganda, between 2004-2005, one of the worst anthrax outbreaks occurred at the Queen Elizabeth National Park (QENP) resulting in the loss of 11% of the hippopotamus population and also affecting zebras, buffalos, warthogs and others (Wafula et al., 2007). An anthrax outbreak during an unusually dry season has been linked to declines in the population of buffalo after 1990 at Kruger National Park (Thuiller et al., 2006).

The major threat will occur where wildlife disease spreads to domestic animals or to humans. The need to control foot-and-mouth diseases, which result from contact between cattle and the buffalo, triggered most veterinary fences in Botswana where the beef industry is traditionally highly regarded. This is in contrast to Tanzania where tourism has more weight in the economy hence leading to less investment in cattle protection at the expense of wildlife. However, there are several cases of wildlife diseases that may spread to humans, e.g. anthrax; thus, an increase in such cases is likely to spark conflicts to the detriment of wildlife (where culling and/or barriers are used to reduce contact between the two (Cleaveland et al., 2005), for example).

Diversifying Tourism in Botswana

The above discussion shows that a tourism industry that is strongly based on climate-sensitive resources (such as wildlife) may not be sustainable in the future due to climate change. There is need to diversify the product away from dependence on nature-based attractions to other, all-inclusive forms of tourism.

The history of tourism in Botswana is short; hence, many types and/or forms of tourism have not yet been explored to diversify the industry. Culture-based attractions offer great potential for diversification given the diverse cultures that co-exist peacefully in the country and the ongoing efforts to revive indigenous-knowledge practices (culture-based tourism relies on numerous attractions such as heritage resources, cultural sites, history, anthropology, cultural landscape, archaeological remains, poetry and music, arts and crafts, and other forms of cultures).

Giraffe in a natural setting in a Photographic Concession area (NG 31) in the Okavango Area. Photo courtesy of Naomi Moswete (September 2011).

The World Tourism Organization (1985, cited in Mckercher & Du Cros, 2002p3) describes cultural-heritage tourism as a form of tourism that deals with the movement of tourists and/or persons toward essentially cultural motivations, such as performing arts, attending cultural festivals and events, visits to sites and monuments, travel to memorial sites, archaeological sites and battle fields, folklore, art or pilgrimages (see Mckercher & Du Cros, 2002; Timothy & Boyd, 2006). Cultural heritage tourism is one of the most notable

and widespread types of tourism (Akama & Sterry, 2002; Timothy & Boyd, 2006). Culture-based tourism is the fastest-growing sub-sector of the tourism industry because many people are becoming more interested in experiencing and appreciating different cultures of nations globally (Akama & Sterry, 2002; Nicholas, Thapa & Ko, 2009; Timothy & Boyd, 2006).

Cultural-heritage tourism is widely seen as one of the mainstays of rural- or countryside-tourism worldwide (Frost, 2003; Robinson, 2001). Research has revealed that culture-based tourism can have positive impacts on the environment, social/cultural institutions and economy of host destinations (Gratton & Taylor, 1995; Nicholas, Thapa & Ko, 2009; Smith, 2003; Terry, 1994). It can promote indigenous resource conservation (Timothy & Boyd, 2006), and contribute to rural economic development through production and sale of local and/or indigenous goods (Frost, 2003; Moswete, Thapa & Lacey, 2009; Tohmo, 2005). Above all, culture-based tourism has the potential to revive the world's dying cultures, within music and dance, initiation schools, traditional healing rituals, rain-making practices, indigenous medicine and handicrafts (Moswete, Thapa & Lacey, 2009; Nicholas, Thapa & Ko, 2009; Smith, 2003; Tohmo, 2005).

The Botswana tourism industry has had little or no emphasis on culture-based tourism in the past. Although culture and heritage have been mentioned as attractions in some of the literature used to market the country, cultural heritage tourism has never been strongly marketed as one of the key tourist resources internationally. For that reason, many heritage sites, including unique monuments, historical sites, stonewall villages, traditions and customs that could be of interest to tourist (GOB, 2001; 2003), are neglected and/or poorly developed for tourism (BTDP, 1999; Mbaiwa, 2004). Yet, the potential of this form of tourism has been demonstrated; for instance, a number of heritage sites have been exploited for culture-based tourism before. These include but are not limited to the renowned world-heritage sites: Tsodilo hills and Lekhubu Island (cultural landscape and history) in Ngamiland district; Manyana rock paintings and David Livingstone Memorial site in the Kweneng district; Lepokole hills near copper and nickel mining townships of Selibe Phikwe and Fort Motloutse; and Solomon's Wall in the east. All these have visitor interpretation center, trails, signage and site personnel (GOB, 2001).

However, there are several other heritage sites that are locally unknown, inadequately documented and exploited for tourism by institutions responsible for heritage management and tourism development – the unique Qcwihaba "historic" caves in the Kalahari sand veldt and Old Palapye ruins in the central district, for example. It is important that cultural-heritage resources, both tangible and intangible, are exploited for tourism to diversify away from over dependence on wildlife-based tourism products that are sensitive to human and climate-change pressures.

The way of life of the people, daily village activities, traditional architecture (huts, kraals), dress, language, local cuisine and preparation, marriage and death ritual performances, arts and crafts, music and dance in Botswana should be packaged and marketed for tourism. Events and festivals (including indigenous and modern dance and music and cuisine) could be organized at different locations to showcase various cultural

aspects of Botswana, like the wine-tasting tourism in South Africa (e.g., Cape Town). Some of the special-event tourism, as with festivals in Edinburgh (Scotland), attracts millions of domestic and overseas tourists (Gratton & Taylor, 1995; Smith, 2003).

Currently, parts of the country with large wildlife diversity, such as the Chobe and Okavango Delta regions, receive the majority of overseas, regional and domestic tourists. Thus, alternative tourism packages that include cultural heritage activities could be initiated and commenced in districts that are not endowed with wildlife resources (e.g., villages and towns in southern Botswana). The advantage of culture-based tourism is the potential to create employment opportunities for rural areas (Moswete, Toteng & Mbaiwa, 2009).

Conclusion

Tourism offers great potential for diversifying Botswana's economy away from mining. However, so far, the emphasis is on wildlife-resource-based tourism. All efforts are required to conserve these resources; in most parts of the world similar resources went extinct. There are indications that wildlife resources are declining due to human activities in southern Africa. In Botswana too, emphasis on the cattle industry has led to fragmentation of wildlife habitats and barriers to their movement in search of water and forage in response to changes in supply. This fact, combined with the indicated increased climate variability due to climate change, puts a dark shade on the sustainability of a wildlife-based tourism product, calling for the need to consider adaptation measures in this sector, and to seek for other alternative tourism attractions and/or products

Culture-based tourism has the potential to diversify tourism and address the acute problem of unemployment in rural areas of Botswana. However, to fully realize this potential, revenues from minerals need to be invested in developing a well-rounded (all-year-round) tourism packages for the domestic, regional and the international market, and these packages should include activities built around nature (i.e., wildlife), culture and heritage resources of Botswana.

There are indications that the country's culture is gradually being revived, but this needs to be harnessed and carefully promoted for tourism purposes. The case for cultural-heritage tourism and its value to Botswana should be made and shared among tourism planners and decision makers with clear links to its socio-economic, environmental and educational benefits.

However, tourism and climate are intertwined (see Gossling & Hall, 2006). Neither culture-based nor nature/wildlife-based tourism products are totally immune to climate change. Exceptionally hot temperatures will drive tourists away (to alternative destinations) as is the case where there is acute shortage of water or outbreak of diseases due to climate extremes. Protection and maintenance of the clean environment, both locally and regionally, is key to a successful tourism industry.

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