

# **Climatic Sensitivity and Snow-based Tourism in Africa: An Investigation of TripAdvisor reviews on Afriski, Lesotho.**

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## **Abstract**

Climate change presents a range of challenges for the tourism industry. Rising temperatures and changes in humidity and precipitation pose significant threats to the snow-based tourism industry and exacerbate its vulnerability to climate change in the long term. However, in the short term the differences between anticipated and experienced weather and the day-to-day variability thereof, can have a significant impact on tourist enjoyment of the destination and their likelihood to return. This has the potential to compromise the economic stability of the enterprise long before climate change yields snow production unaffordable. This study investigates the climatic sensitivity and experiences of weather among tourists who have travelled to the Afriski resort in Lesotho through an analysis of TripAdvisor reviews for the operation. The reviews highlight the importance of artificial snow production and a diversification of tourist activities, and the importance of snow and cold temperature to the tourist experience.

Key words: snow-based tourism, climate change, climate sensitivity, TripAdvisor

## **Introduction**

Climate change poses considerable threats to the tourism industry globally (Hall, Gössling and Scott, 2012). In many places changing environmental conditions are largely responsible for documented declines in tourist experiences and satisfaction and changes in their various travel decisions (Scott, Gössling and de Freitas, 2008). Local climatic conditions are critical for the viability of numerous tourism activities, particularly those which involve natural attractions. The snow-based tourism industry is arguably one of the most vulnerable tourism subsectors to the threats of climate change, due to the critical temperature thresholds for snow production and maintenance (Bicknell and Mcmanus, 2016).

This paper focuses on a very specific and highly vulnerable snow-based tourism destination: the Afriski skiing resort. It is a snow dependent resort located in the Kingdom of Lesotho in southern Africa, offering a unique skiing experience in the region. According to Vanat (2017) there are only two skiing resorts in southern Africa. Given the contemporary marginal temperatures for a snow-based tourism attraction, climate change poses a significant threat to sustained tourism at Afriski in the long term. However, more pressing is the issue of tourist sensitivity to the current climatic variability, which may serve as a disincentive to visitors long before snow production is hampered (Hoogendoorn and Fitchett, 2018a).

An understanding of perceptions of both tourist and the sector's managerial stakeholders regarding climate change are important in facilitating successful adaptation to protect the tourism sector. Research on climate change and tourism in neighboring South Africa has demonstrated a notable disjunct between the climate change threats of concern to tourists and accommodation establishment proprietors,

which results in adaptation strategies that are not aligned with tourist priorities (Hambira et al., 2013; Hoogendoorn, Grant and Fitchett, 2016). In particular the conflicting timelines associated with contemporary climate variability, resulting in a heightened incidence of poor weather, and the long-term implications of prolonged climate change, result in the needs at both scales being poorly addressed (Hoogendoorn and Fitchett, 2018a). At the short-term scale, an understanding of the extent to which climatic factors frame tourists' satisfaction of their vacation at a destination, and the primary meteorological factors which affect a positive or negative experience, contribute to an improved baseline from which effective adaptation can be implemented to improve the current tourist experience. In the context of progressive climate change, many of these adaptations to contemporary climatic issues may additionally reduce the longer-term vulnerability of the destination and subsector as a whole.

In the case of experiences of weather during vacation, as opposed to perceptions regarding long-term climate change prospects, Denstadli et al. (2011) argue that tourists' self-reported accounts of satisfaction are more reliable than information obtained through direct questioning. In this respect, TripAdvisor represents a very useful database to capture tourists' experiences of the weather at a climatically marginal skiing destination. To this end, this paper explores the reports of tourists on TripAdvisor regarding the weather experienced during their vacation at Afriski

### **Climate Change and Tourism**

Weather and climate factors are important to the discussion on climate change and tourism as they have a direct impact on tourist behaviors and their travel decisions as

well as the physical experience and visiting tourist satisfaction (Scott, Gössling and de Freitas, 2008). Tourists, notably ecotourism and adventure tourism enthusiasts will frequently travel to a particular destination with the intention of experiencing specific environmental conditions (Strobl, Teichmann and Peters, 2015). Additionally, many outdoor and adventure tourism activities are directly dependent on specific conditions that may range from sunshine to rain to windy conditions and as such tourists will base many of their travel choices and specifically their travel destination accordingly (Ridderstaat et al., 2014). Climate can also play an important role in both their perceptions and level of satisfaction experienced by the traveler, which further influences tourist behaviors (Rosselló-Nadal, 2014). The way in which a tourist perceives a destination and the expected conditions at that location can significantly impact on the tourists' net satisfaction when compared to the physical conditions that they experience when they journey to the destination in reality (Jopp et al., 2014). It is important to note that travelling with the intension of experiencing weather and climactic conditions that are different to a tourists everyday experiences is an important motivation for travel as the considerably different context or environment may be appealing when compared to that of the tourists' home (Saarinen and Tervo, 2006; Steiger, Abegg and Jänicke, 2016; Jeuring, 2017). If a traveler journeys to a location to experience specific expected weather features, for example sun shine on a beach or snowfall in the mountains, they may be extremely disappointed or dissatisfied if they were to in reality experience unexpected rain at the beach and extreme winds at a snow-based resort. In this way, climate and by extension the threats of a changing climate, significantly impacts on the level of satisfaction and the way in which tourists experience a travel and a destination with its accompanying climactic conditions (Dubois et al., 2016).

Linked with this perception, is the concept of destination image, as the way a destination is visualized or portrayed is important to the tourists destination selection process (Chi and Qu, 2008). This is important as changing weather and climatic conditions as well as extreme weather events can make a destination unappealing for tourists and as such climate change can negatively impact the tourism potential or appeal of a travel destination (Lee, Chen and Huang, 2014). The importance of a destination image as held by tourists, is accompanied by the concept of place loyalty. Increased tourist satisfaction and pleasant experiences at a destination, can lead to a sense of loyalty towards the location and with that a positive image of the destination that can influence its ultimate survival or failure as such (Ramseook-Munhurrun, Seebaluck and Naidoo, 2015; Chen and Prebensen, 2017). These positive sentiments all contribute to the overall satisfaction and positive experiences of tourists and will encourage future return visits that can work to the advantage of a destination when faced with climatic concerns (Zhang et al., 2014). Work by Živković, Gajić and Brdar (2014) investigates the usage of social media platforms as tools for improving tourist satisfaction levels as well as enhancing tourist experiences. Platforms such as TripAdvisor are highly relevant to the investigation into using social media to understand personal experiences of climate by tourists. This, as reviews posted in a personal capacity have been suggested to hold greater value, trust and reliability than reflections collected by research professionals (Jeacle and Carter, 2011).

Climate change has impact on tourism seasonality. Thus, it is very important for marketers and managers of the tourism industry to understand and even predict with relative accuracy the weather conditions in order to reduce the gap created by seasonality with regards to the off peak season (Goh, 2012). This, as well as to ensure

that the conditions tourists will experience are in line with their expectations and that the attractions and activities offered to these tourists will be available and undisturbed by weather conditions (Ridderstaat et al., 2014). Climate change has also introduced an issue of rising temperatures which can lead to extreme torridity and heatwaves, this can have a negative impact on tourists' experiences and satisfaction levels as a "thermal comfort threshold" that is exceeded can lead to greater tourist climate sensitivity and discomfort (Rutty and Scott, 2010:268). This is significant as it can detract from the appeal of summer locations and reduce the potential for return visits.

Summer-dependent coastal tourism for example is significantly affected by climate change in various ways included in which is an increase in global temperatures, increased precipitation in some areas and rising sea levels which leads to infrastructural damages, salt water intrusion, the destruction of natural habitats, coral bleaching and a loss of biodiversity (Zeppel, 2012; Oyedotun, Ruiz-Luna and Navarro-Hernández, 2018). This loss of biodiversity can all be hazardous to the coastal tourism industry, especially in terms of ecotourism (Nicholls et al., 2007). They can also significantly decrease tourists' net satisfaction or result in a poor travelling experience when the attraction does not meet expectations. For example a coral reef, that was the motivation for travelling, it is significantly damaged in reality could be disappointing to the tourist as it does not meet their expectations (Coghlan, 2012). Damaged natural attractions that become damaged and loose diversity become unappealing as a tourism resource and does not attract as many tourists as previously (Newsome, Moore and Dowling, 2013).

Climate change and its negative impact on natural resources can be presented in various other contexts including that of snow-based destinations where a major

concern is the reduced tourist satisfaction and positive experiences of snow (Cocolas, Walters and Ruhanen, 2015). As a snow based industry the Afriski resort is highly vulnerable to the challenges of climate change and the threat posed towards tourist satisfaction due to the resultant climactic threats, included in which is a decrease in both snow quality and snowfall frequency (Rosselló-Nadal, 2014). In order to ensure the longevity of this sector, strategic planning with the goal of sustainable development is essential to ensure tourist satisfaction as well as to maintain a balance between natural, cultural and economic resources for the future (Phillips and Moutinho, 2014).

It is important to look more specifically into the context of climate change and its impacts in Global South (Kájan and Saarinen, 2013), here specifically within the southern African tourism industry. Sub-Saharan Africa is a significant location within the field of ecotourism and as such plays an important role in the conservation of the environment, often through using tourism as a means of sustainable development (Saarinen et al., 2012; Hausmann et al., 2017). In this region most tourism research has been focused towards nature, adventure, culture and heritage tourism activities (Rogerson and Visser, 2011). There is a deficit within southern African research as there are a very limited number of studies into snow-based tourism (see Scott and Becken, 2010). With a specific focus on Lesotho there is even less available research, while there have been some studies into tourism as it emerges in Lesotho that are focused towards development (Rogerson and Visser, 2007; Rogerson and Letsie, 2013) there are no studies specifically focused towards climate change and its consequences (Rogerson and Visser, 2011).

This research intends to contribute towards the missing academic niche of Global South snow-based tourism industry. Through this unique perspective of investigating

snow-based tourism in southern Africa a new geographical front of the climate change tourism debate is presented. Afriski is one of two existing ski resorts in southern Africa and as such serves as an interesting case study into climate change and its impacts on the snow-based tourism industry from an African perspective (Vanat, 2017).

## **Methods**

The methodology adopted here is based on the pilot studies conducted by Fitchett and Hoogendoorn (2018b), developed from netnographic tourism research (cf. Miguéns et al., 2008; O'Connor, 2008, 2010; Buzinde et al., 2010; Vásquez et al., 2011; Ayeh et al., 2013; Amaral et al., 2014). This involves the textual analysis of tourist-authored online comments, posted on TripAdvisor ([www.tripadvisor.com](http://www.tripadvisor.com)). For this study, all comments relating to Afriski (dual listed as an accommodation establishment and an activity destination) were considered for the period 2009-2017. Comments were first binary classified as containing mentions of the weather (hereafter 'climatic factors') or not. For those that did contain mentions of climatic factors, the comments were coded on the basis of the climatic factor mentioned, and for comments relating to artificial snow production. Frequency distributions of the mentions of each climatic factor were then calculated, and key quotes extracted.

## **Results**

A considerable 66 out of 259 reviews posted on TripAdvisor relating to Afriski mentioned climatic factors, yielding a net climatic sensitivity of 25.48%. Climatically themed comments may refer to more than one climate factor, with a total of 74 factors mentioned. Of the reviews containing mentions of climatic factors, the greatest



proportion (58%) were of snow, followed by cold conditions (22%, Figure 2). This can be seen as expected, given that the peak tourism season at Afriski is during winter months. It does however indicate that the presence and absence of snow is considered a review-worthy issue amongst tourists.

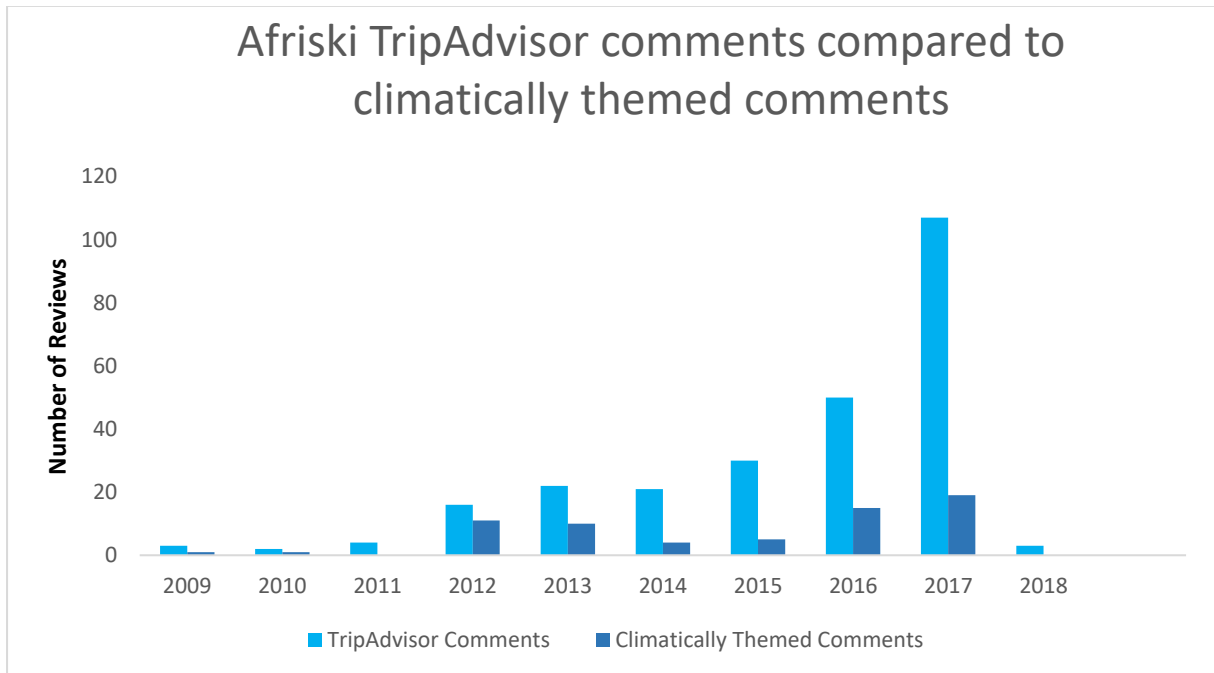


Figure 1: Afriski TripAdvisor comments compared to climatically themed comments

There is an overall positive trend over the nine years examined, in terms of an increase of climatically relevant comments starting with one in 2009 and 19 in 2017. However, in 2012 and 2013 there was a marked increase in comments with 11 and 10 comments respectively, followed by a significant decline to four comments in 2014 but back up to 15 by 2016 (Figure 1). This overall growing trend may be a result of increasing awareness of climate and environmental conditions amongst tourists.

Positive reflections on the climate during their visit comprise 67% of the climatically themed comments, with remarks such as

“Who says theres no snow in Africa! there actually is and its quite impressive” by dinieahza, 20 July 2012,

“The snow was fantastic”, BlondePretoria, 12 July 2012,

and

“We were blessed with 2 feet of snow while travelling en route to Afriski in the mountains. When you descend from the top of the pass, you see this wonderland. Like a magazine. We spent the day on the slopes tubing and relaxing. Excellent weather”, Pieterkonkrete, 23 August 2016.

A further 21% of the climate-containing reviews were more neutral in their commentary. For example:

“To ski under the warm sun is an experience. Pack warm clothes, thermal undies and thin layers of clothes. Mid- day was hot and we stripped down to parachute pants, thermals and light long sleeved tops”, DecoDiver08, 20 June 2013.

Only 12% of the reviews containing climatic mentions involved negative comments regarding the weather,

“There is only 1 slope, and not the full length is open due to insufficient snow.”, Paola B, 6 July 2016.

And

“Of course, Afriski is a place that can have very tough weather conditions, so occasionally there are times where there are some infrastructure problems”, sven594, 7 September 2017.

With respect to other climate comment patterns, a significant increase in comments is presented between the months June to September with the highest number of comments, 24, in July. This is a reasonable assumption as this period is the peak of the winter and skiing season which is when the Afriski resort would be host to the most guests. Furthermore, this month coincides with school holidays which are a popular time for increased tourist numbers at this ski resort (Chung, 2009; Schultz, 2018, pers comm). While there are more comments from October to December there are a significantly lower number of comments from January to May with one comment being the highest for any month within this time frame.

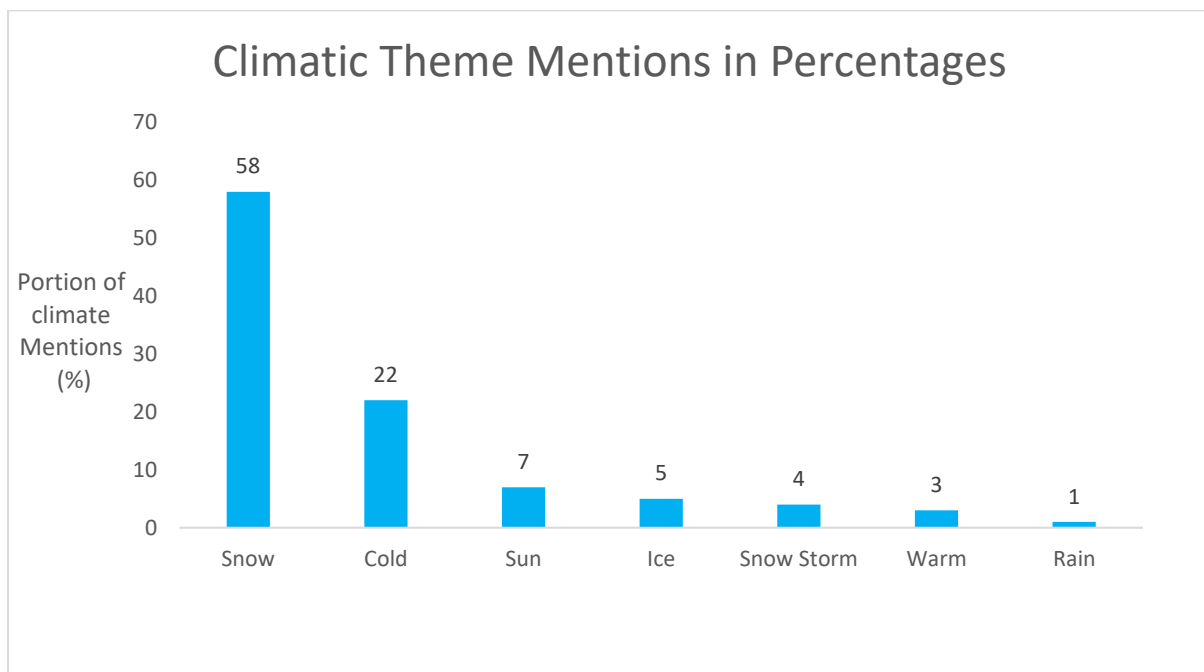


Figure 2: Climatic Theme Mentions in percentages

When looking into the specific climatic themes that come through in the TripAdvisor comments seven prevalent concepts were identified that range from snow, cold and ice to sun and warm as evident in Figure 2. These concepts were mentioned a total of 74 within the 66 identified climatically themed comments. The climatic condition with

the highest percentage mention is that of snow with 58%. This could be expected as Afriski is primarily a skiing resort which attracts many tourists specifically to experience snow. These comments often relate to the presence or condition of snow for example “Good snow quality even though no proper snowfall.” This is followed by the theme of cold with 22% while rain has the lowest mention percentage with only 1%. This includes comments such as “AfriSki is an awesome place, very cold but worth it if you are into the snow and ice” referring to both the cold and snow, “DO NOT underestimate the warning of cold weather. The cold you feel in the mountains of Lesotho is very different then the "chilly" KZN weather”, and “It was the start of summer when we visited so no snow (a huge thunder storm instead!)...” in reference to rain.

In addition to these climatic condition themes, there are several comments that relate specifically to skiing at this resort. These comments likewise vary from comments relating to the enjoyment of skiing such as “We had a great skiing experience” and “Slopes were awesome and we had loads of fun!”, to many remarks on the unique experience of skiing in Africa. Many reviews expressed positive feedback on being able to ski in Africa with phrases such as “It’s wonderful to be able to experience this in Africa”, “You are skiing in Africa which is already an experience.” And “Some may say skiing in Africa is impossible. Afriski has made the impossible, possible...”. Other comments regarding skiing are interesting in that they express an interest in opportunities beyond skiing with remarks such as, “If you do not want to ski, you can go bum boarding or just walk around and enjoy the view.” And “If you don’t want to venture out on skis, you can just enjoy the scenery and relax on their well laid out wooden deck while watching the others.”. This shows significant progress and development within the resort when compared to a comment from 2012 that states,

“You have to hope the weather is conducive to skiing because there is little else to do except some mountain hiking.”

The TripAdvisor reviews also contained comments relating to non-snow based activities on offer. This is important for the adaptation of this resort under climate change, which due to the warming temperatures will likely shorten the ski season. Tourists expressed much satisfaction with the activities and opportunities presented throughout the year and beyond snow-dependant activities. This is apparent through comments with the following examples, “The mountain biking in summer is also excellent and they are working hard to extend the trails.”, “Take a hike in Summer to enjoy the majestic views of the Maluti mountains or go up a ski lift to try out the enduro tracks.” And “We really enjoyed our 3 day stay for OCR (Obstacle Course Racing) The highest obstacle race in Africa.”. Tourists to Afriski aid in marketing the destination for non-snow-dependent activities, with comments such as: “there is so much more than just skiing on offer.” One other significant comment about the climatic experiences and tourist opportunities of Afriski goes as follows:

“It proves that Africa is not only about sun, beach, sand but also SNOW! Come experience true Lesotho cold weather while you sip on your gluhwein. Afriski is modern facility that also provides summer activities e.g. pony rides, mountain biking, trail runs, fly fishing and water rafting at high rain season.” By maloti2013, 26 June 2013.

The second adaptation mechanism, as a response to the challenges or climate change is that of the artificial production of snow. This practice is evident at Afriski and has been noticed by visiting tourists who have made remarks such as “I went skiing at Afriski in Lesotho during July and even though it was not snowing, the manmade snow

was still loads of fun.”, “ The ski slopes fantastic (even though there was no snow, they made snow)” and “Unless you are very lucky and get real snow, all the slopes are made using snow machines. Still good quality - you barely notice the difference, especially if freshly made and plowed.”. These comments are relevant as they show that climate change is cause and motivation for real adaptive responses to tourism facilities such as the Afriski resort, and as such the tourists are impacted by and aware of some of the direct consequences of climate change to their travelling experiences.

Some reviews suggest concern or awareness of climate change, which are often expressed through comparisons between a previous trip and the latest visit to Afriski. For example, “Nowhere near as much snow as last year, but we had 900m and plenty to keep all of us occupied.” Shows the there is a decrease in the presence of snow between two trips. Concern was also expressed about the practice of snow making in terms of “We love the snow you make and finding the slopes so empty, but fear this may not be sustainable”. The growing challenges of climate change has led to the serious need for human intervention to manipulate climatic conditions and “Most of winter they make use of artificial snow to maintain the ski slopes.”. However, a positive view on climate change could be expressed with the slightly milder conditions being a more pleasant experience as evident by the following comment, “I loved the weather, it was chilly and sunny at the same time”.

## **Discussion and Conclusions**

The relevance of these results can be contextualized through a comparison within the broader literature on the topic of the climatic sensitivity of African snow tourists and other investigations into online reviewing platforms such as TripAdvisor. The net

climatic sensitivity of 25.48% in this investigation is significantly high, this is clearly evident when compared to other similar studies. For example, work by Fitchett and Hoogendoorn (2018c) found a net climatic sensitivity of 7.9% despite a much larger study size with a total of 497 climatically themed comments out of 5898. The relative yet significantly greater number of climatic mentions in this study is thus very interesting. To further this comparison, the theme 'cold' was the most frequent condition experienced and mentioned by tourists (180 times) in analyses of TripAdvisor reviews for South Africa (Fitchett and Hoogendoorn, 2018c), while it was the second most common climatic condition in this work, being mentioned 22 times, falling second to that of 'snow'. This is interesting as snow is a highly uncommon feature within Southern Africa yet it serves as one of the most attractive and unique features of the Afriski resort, which would serve as a justification of why snow is such a commonly reviewed feature by tourists who visit this destination (Vanat, 2017). Tourist expectations also play an important role in the way in which they review and experience climactic conditions, the comparison between what they expect and what they physically experience in reality may serve as a true representation of tourist climactic sensitivity (Fitchett and Hoogendoorn, 2018b). With specific reference to the Afriski tourist reviewers many online comments were posted as a description of whether the snow conditions met their expectations or not with a range of positive reflections, negative or disappointed experiences of snow or the lack there of as well as neutral comments where tourists experienced exactly what they were expecting to. With the primary attraction at Afriski is the snow, a climatic feature, it would be logical that there would be a significant number of comments that describe snow and the other accompanying climatic conditions, as the destination's tourist attractions for Afriski.

When investigating reviews of snow at a snow-based tourist destination it is also important to explore and understand why a tourist would feel motivated to post an online review. It has been suggested that the process of exchanging knowledge, that can be based in experiences, with the public could be based in an altruistic concern for others or a sense of public duty as a means to contributing to the wellbeing and experiences of others (McLure, Wasko and Faraj, 2000). This is evident in the TripAdvisor reviews as many of the reviewers post warnings and advice to potential future guests about the importance of packing warm enough clothes and travelling slowly and carefully up the mountain to reach the Afriski resort. A second motivation for posting to media forums such as TripAdvisor is to express the relationship between the tourists' expectations and their actual experiences, despite the highly personal and subjective nature of this comparison (Scott and Orlikowski, 2012). This is particularly relevant at a resort such as Afriski because of their artificial production of snow and its resultant snow quality and quantity which may differ significantly between reality and potential tourist expectations. In this way multiple experiences of the snow at this resort can be shared and compared and as such a detailed description is provided into when the snow is best as well as what snow-based activities are available and when amongst various other snow-related factors. As such future potential tourists can align their travel decisions and manage their expectations for what they will experience in terms of snow at the resort under various circumstances in accordance with previous experiences of tourists who have posted to TripAdvisor. Potential tourists often conduct much research into their travel destination of choice and as such seek out valuable information which experienced tourists are willing and enthusiastic to share (Hyde and Olesen, 2011).



Climatic sensitivity can be expressed through large quantities of climatically motivated reviews, as they frequently illustrate how tourists physically experience weather and environmental conditions while visiting a destination (Scott and Lemieux, 2010). Afriski relies heavily on outdoor recreational activities and natural attractions both of which are highly vulnerable to climatic conditions (Hoogendoorn, Grant and Fitchett, 2016). As a result, many of the reviews posted to TripAdvisor are descriptions of the Afriski activities that are available and of what quality, with specific reference to the weather and other environmental conditions as experienced by tourists. This large database reviewing Afriski allows for the online commentary, of the climactic experiences of tourists, posted to platforms such as TripAdvisor to be an effective means of tracking climate sensitivity.

With regards to the future of Afriski it is important to understand briefly the global experiences of climate change and the winter tourism industry. Skiing and other snow based activities are extremely vulnerable to the effects of climate change (Kaján and Saarinen, 2013), most notably through the rising of global temperatures and the unpredictability of environmental conditions such as snowfall, on which this industry directly depends (Scott et al., 2017). Losses in the snow-based tourism industry hold implications for all businesses and stakeholders who depend on both good snow conditions and on tourists who come to experience this snow, and as such lifestyles and livelihoods of local communities are threatened (Brouder and Lundmark, 2011). In response to this extreme vulnerability towards climate change and the losses incurred by the snow-based tourism industry, various adaptation mechanisms are being investigated and some have already been introduced (Landauer, Pröbstl and Haider, 2012). One of the most commonly practiced or implemented of such is the artificial production of snow (Steiger and Mayer, 2008) this process as is presently

being undertaken at the Afriski resort which has had snow making facilities since its emergence as a ski resort.

A secondary adaptation mechanism is that of diversification and the introduction of various non snow-dependent activities that can be offered as a yearlong attraction. Afriski as a resort has also employed this technique through the introduction of other recreational activities including hiking or mountain-biking trails, high altitude training facilities, obstacle courses, fishing and birding opportunities. While these activities are not dependent on snow, they can still be vulnerable to other climactic conditions and as they are less unique when compared to skiing in Africa, they can introduce their own concerns such as a need to compete with other specialized and existing summer based tourism industries (Kaján and Saarinen, 2013). While the TripAdvisor reviews of Afriski are dominantly focused on snow, many reviews have expressed that tourists enjoy and are pleased to experience the other activities offered by this resort.

In conclusion, climate change introduces numerous issues and concerns within the tourism industry, many of these apply specifically to snow-based tourism in Global South contexts, which are characteristically highly vulnerable (with relatively low adaptive capacity) towards the impacts of climate change. These concerns have been highlighted through evidence of tourist climactic sensitivity as expressed through TripAdvisor reviews based on their experiences of weather and climate when visiting the Afriski Mountain resort in Lesotho. This online commentary is interesting and relevant to the global conversation into the impacts and consequences of climate change on tourism in that tourists who are being directly affected are conscious and aware of the changes surrounding their travelling environments. Within the context of extremely limited academic studies into snow-based tourism from the Global South,

specifically from a southern African perspective, this work contributes to an academic deficit and hopes to encourage further studies into unique experiences of African tourism such as Afriski. This, as well as to highlight the importance of understanding the climactic sensitivity of tourists who are directly impacted and affected by climate change.

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