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TOURISM AT A CROSSROADS IN THE AGE OF CLIMATE CHANGE IN BOJANALA PLATINUM DISTRICT MUNICIPALITY, NORTHWEST SOUTH AFRICA: CRISES OF ADAPTATION AND MITIGATION

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ABSTRACT

Climate change research is fast growing, with increasing information on the relationship between climate change and tourism. Globally, tourism is sensitive to climate, meaning that the effects of climate change may change tourism flow and demand. Developing countries are those most affected by climate change. The consequence for tourism is disturbing as this sector contributes greatly to their economies. South African tourism depends on its environment to attract tourists; climatic change is a threat to the environment; therefore this is a major concern for South Africa. This article examines the perceptions of climate change threats within the tourism industry in Bojanala Platinum District Municipality in Northwest Province by exploring how perceptions can influence behaviour and how the tourism industry responds to a changing climate. The Bojanala Platinum District Municipality is dependent on its local tourism sector to drive its economy. While both the tourists and tourism operators are aware of the threat of climate change and are concerned about its impacts, there are no or very few adaptations and mitigation measures being implemented. The lack of climate change planning to deal with these impacts is likely associated with perception. The tourism sector establishments consider it is the responsibility of the government to respond to climate change. This will have implications beyond Bonjanala Platinum District.

Keywords: South Africa, Bojanala Platinum District Municipality, climate change, tourism, adaptation, mitigation

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INTRODUCTION

Environmental change is possibly the most overwhelming event testing humanity in the 21st century.[1] Not only have individuals created interest in the topic of environmental change, but worldwide associations have become involved through the Intergovernmental Panel on Climate Change (IPCC), established in 1988 by the World Meteorological Organization and United Nations Environment Program. Environmental change has shaped our day-by-day life. Not one day passes without the print press, television, and radio broadcasts revealing reasons for environmental change and its disastrous impacts. Studies have likewise shown that environmental change affects the tourism industry.

The tourism industry creates employment and wealth and contributes to financial, ecological, social, and sustainable growth. A distinct three-route connection lies between the tourism industry, environmental change, and feasible development. This three-route connection can be depicted as follows:

- Interaction: Tourism as a service-based sector depends on cooperation either directly or indirectly between the visitors, the environment, and the host communities.[2] As indicated by Swabrooke, tourism is "an action which is adjusted by various different exercises, for example, hospitality and transport which produce goods and services as food, drink, leisure facilities and visitor's attractions".[3] These goods and services create interaction between the host, the environment, and the visitors.
- Awareness: Tourism makes visitors and hosts aware of climatic issues and the differences between nations and cultures. This affects their attitudes and raises concerns over sustainability, not only when tourists travel but throughout their lives. In the Egyptian Red Sea tourism industry, it has been proven that tourists know about the altering coral conditions because of climatic change, hence their intention to look elsewhere for snorkeling and scuba diving opportunities.
- Dependency: Tourism depends on guests hoping to encounter a spotless and flawless climate, appealing regular assets, and solid memorable and social

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[1] Stefan Gössling, Daniel Scott, C. Michael Hall, Jean-Paul Ceron, and Ghislain Dubois, '*Consumer Behaviour and Demand Response of Tourists to Climate Change*' Annals of Tourism Research. (2012) vol 39(1), pp 36–58, pp 50.

[2] Seyed Siamak Mousavi, 'Effective Elements on E-Marketing strategy in Tourism Industry' (2012) University of Trier, Njemačka: Department of Geography and Tourism Dissertation.

[3] John Swarbrooke and Susan Horner, Consumer Behaviour in Tourism (2nd edn, Taylor & Francis, 2007).

practices, as well as welcome hosts with whom good relationships are established. It cannot, therefore, be contended that the tourism industry can rely on these three attributes, namely travel industry, environmental change, and practical improvement.[4] The connection between the travel industry, environmental change, and practical improvement has been examined in tourism literature discourse and policy documents.[5] Economically, the tourism industry is a subgroup of industries, albeit manageable the travel industry advancement isn't equivalent to reasonable sustainability.[6]

The tourism industry and sustainable advancement can be traced back to the World Commission on Environment and Development (WCED report, the United Nations (UN) Brundtland Report of 1987,[7] with the objective of moving from what is referred to as market-oriented fiscal measures and unhindered fiscal development to include wealth preservation and sustenance among other elements.[8] The notion and philosophies behind the policy of sustainable development lie in the principle as outlined by the WCED which characterized sustainable development as "an improvement that addresses the issues of the current age without bargaining the capacity of people in the future to address their own issues".[9] In functional terms, it implies an improvement that looks for equity and value inside the ages and that acknowledges a design where financial, social, and ecological qualities of advancement are seen in an all-encompassing way. Putting this differently, the International Law Association in 2002 affirmed that the objective of sustainable development involves a comprehensive and integrated approach to economic, social, and political processes, aimed at the sustainable use of natural resources of

[4] Charles Goeldner and Brent Ritchie, Tourism: Practices, Principles, Philosophies (John Wiley and Sons Inc, 2012).

[5] Daniel Scott, 'Why Sustainable Tourism Must Address Climate change', Journal of Sustainable Tourism (2011) vol 19(1) pp 20.

[6] Daniel Scott, C Michael Hall and Stefan Gossling, Tourism and Climate Change: Impacts, Adaptation and Mitigation (Routledge, 2012).

[7] Environment and Development (WCED), Our Common Future: Report of the World Commission on Environment and Development (un.org) ('the Brundtland Report') accessed 10 October 2024.

[8] See for example A review of the relationships and impact of market orientation and market positioning on organisational performance: Journal of Strategic Marketing: Vol 21, No 6 - Get Access (tandfonline.com) accessed 10 October 2024.

[9] The Brundtland Report (n7) pp 43.

the Earth and the protection of the environment on which nature and human life as well as social and economic development depend.[10]

Further, sustainable development seeks to realize the right of all human beings to an adequate living standard based on their active, free, and meaningful participation in development and the fair distribution of benefits resulting therefrom, with due regard to the needs and interests of future generations. These objectives incorporate the goal of establishing the balance between social, economic, and political processes, sustainable use of natural resources or the protection of the environment and human life and meeting the needs of present generations without compromising the ability of future generations to meet theirs. Here, the application of the precautionary principle is relevant in its aim at protecting human health, natural resources, and the environment to avoid depletion now and in the future. Albeit this idea is generally acknowledged, McCool et al observe that the execution of maintainable advancement represents some genuine and profoundly complex issues confronting the present-day calamity of worldwide environmental change.[11]

McCool et al explain that looking at the societal, financial, and ecological strength of sustainable development, shareholders have applied the concept of sustainable tourism with their knowledge of administrative resources, ecological conservation, communal development and poverty relief. This framing of the issues is used to extend the existence of private tourism companies as well as advertising firms. The guideline for manageable improvement accentuating the significance of monetary and social responsibility as the mainstay of manageability generates difficult issues about 'reasonable tourism' and what is a 'reasonable tourism industry'.[12] Since 1978, the idea of sustainability as enshrined in studies of tourism and sustainable tourism has been described as promoting "may be the most unmistakable highlights of contemporary tourism industry discussion".[13]

The tradition of sustainability has been challenged considerably by climate change, leading to a demand that the spatial-brief limits of local sustainable

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[10] ILA New Delhi Declaration of Principles of InternationalLaw Relating to Sustainable Development | International Environmental Agreements: Politics, Law and Economics (springer.com) accessed 10 October 2024.

[11] Stephen McCool, Richard Butler, Ralf Buckley, David Weaver, and Brian Wheeler, 'Is the Concept of Sustainability Utopian: Ideally Perfect but Impracticable?' *Tourism Recreation Research* (2013) vol 38(2) pp 213–232 pp 215.

[12] McCool (11).

[13] Patricia A Higgins and M Shirley Moore. 'Levels of theoretical thinking in nursing'. Nursing Outlook (2000) vol 48(4) pp 180.

growth be restructured.[14] This restructuring has cast doubt on the very idea of sustainable tourism. Sustainability in the tourism industry as a set piece of the industry and sustainable advancement is intended to accomplish three objectives, specifically to improve personal satisfaction of the host networks, to accomplish guest fulfillment, and to secure regular assets in the object nations.[15] Therefore, as explained by Bostrom et al in 2013[16] and Karlsson in 2015,[17] climate change has laboured the concepts of sustainability, prompting its restructuring because it has cast some shadow on the notion of sustainable tourism.[18] Steps must be taken to address these complex social and environmental structures that strengthen sustainable tourism,[19] yet barely any investigations have been initiated on the environmental change generated by tourism industry impact in Africa.[20] Given this general gap in climate change tourism assessment, the examination explored here zeroed in on the effects of environmental change on the tourism industry in Bojanala Platinum District Municipality of the Northwest Province as a

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[14] Stephen Espiner, Caroline Orchiston, and James Higham, 'Resilience and Sustainability: A Complementary Relationship? Towards a Practical Conceptual Model for the Sustainability–Resilience Nexus in Tourism'. Journal of Sustainable Tourism. (2017) vol 25(10) pp 1385–1400, Resilience and sustainability: a complementary relationship? Towards a practical conceptual model for the sustainability–resilience nexus in tourism: Journal of Sustainable Tourism: Vol 25, No 10 (tandfonline.com) (accessed 10 October 2024).

[15] Daniel Scott, C Michael Hall, and Stefan Gossling, *Tourism and Climate Change: Impacts, Adaptation and Mitigation* (Routledge, 2012).

[16] Ann Bostrom, Gisela Bohm, Robert E O'Connor, 'Targeting and tailoring climate change communications, Wires Climate Change', Targeting and tailoring climate change communications - Bostrom - 2013 - WIREs Climate Change - Wiley Online Library accessed 10 October 2024.

[17] Christer Karlsson et al, (PDF) Climate change leaders and followers: Leadership recognition and selection in the UNFCCC negotiations | Christer Karlsson, Mattias Hjerpe, and Charles F Parker - Academia.edu accessed 10 October 2024.

[18] Stephen Espiner, Caroline Orchiston, and James Higham. 'Resilience and Sustainability: A Complementary Relationship? Towards a Practical Conceptual Model for the Sustainability–Resilience Nexus in Tourism'. Journal of Sustainable Tourism. (2017) Vol 25(10) pp 1369.

[19] Stephen McCool, 'Sustainable Tourism: Guiding Fiction, Social Trap or Path to Resilience'. Challenges in tourism Research (2015) pp 70, 230.

[20] Awad Elkarim Suliman Osman Khalifa, Elamin Sanjak, Elham Mohammed El Sheikh El Gorashi, Mohamed Eltom Elhaja, Elmar Csaplovics, and Ahmed Ismail Ahmed Safi, 'Impact of Climate Change on Agro-forestry System and Adaptation Strategies, Bara Locality, North Kordofan, Sudan'. Asian Journal of Research and Review in Agriculture. (2021) Vol. 3(1) 117–129, pp 120.

well-defined part of South Africa, analyzing the municipality tourism industry administrators' knowledge and the expected coping strategies.

Problem Statement

The reason for the investigation was to build up the impression of the tourism industry operators on environmental change's impacts on the tourism industry. The initial literature assessment carried out on this subject confirmed that there are very few studies on tourism environmental change, particularly in non-industrial nations in areas of vulnerability and projected atmospheric effects on tourism, especially regarding mitigation and adaptation strategies. South Africa as a non-industrial "third world" nation that incorporates the Bojanala Platinum District Municipality is overwhelmed by the effects of environmental change which are complex to address. The climate change threat is projected to result in less rainfall, causing drought and high temperature increases that will disastrously hinder outdoor and other tourism activities. The economic potential of the tourist infrastructures, tourism sector, and the small tourist towns such as the Bojanala District and the economy at large will be destroyed in the absence of sufficient awareness and action taken to moderate and adjust to the danger. This gap was the inspiration driving the present investigation.

Aim

The aim of the investigation was to understand how the stakeholders perceive climate change coping strategies (mitigation and adaptation) in the Bojanala Platinum District Municipality in the Northwest Province of South Africa.

Objectives

As to the previously mentioned point, the key examination goals of the investigation incorporated the following:

1. To distinguish the impacts of environmental change on the tourism industry area of the Bojanala Platinum District Municipality.
2. To examine the adaptation and mitigation strategies adopted by tourism operators in Bojanala District Municipality.
3. To highlight difficulties in the implementation of the climate change coping strategies (mitigation and adaptation) in Bojanala Platinum District Municipality.

LITERATURE REVIEW

Climate Change

Right now, and over many years, worldwide temperature has risen to cosmically prominent levels. The explanation lies in the expansions in normal worldwide air and sea temperature, the liquefying of snow and ice, and the ascent of the world-wide ocean level. The Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report showed that environmental change is self-evident and clear. Climatic and sea temperatures have risen enormously, more than in the previous hundreds of years and perhaps more than in the previous thousand years.[21] Researchers have demonstrated that ozone-harming substances adopt a 'sweeping' catching motion in approaching sun-based energy, keeping the world's surface at a sweltering level than ordinarily expected, and that a heightening in air ozone-depleting substances prompts extra warming.[22] Environmental change and an Earth-wide temperature boost are animated by the amassing of ozone-harming substances (GHGs) including carbon dioxide, nitrous oxide, and methane in the atmosphere due to human action consumption of non-renewable energy sources, bramble consumption, and cooking.

Causes of Climate Change

Weather change is one of the major threats challenging humankind in the twenty-first century.[23] It is far due to somewhat because of 'nursery gases' as an after-impact of human activities. Climate change is a threat to the world economy when

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[21] RK Pachauri, A Reisinger. Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007: Synthesis Report. (2007) Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. IPCC, Geneva, Switzerland, pp 104. <https://www.ipcc.ch/report/ar4/syr/#:~:text=When%20quoting%2C%20citing%20or%20distributing,Climate%20Change%202007%3A%20Synthesis%20Report> accessed 23 February 2024.

[22] Lere Amusan, Frank Odimegwu. 'Development at the crossroad in the age of climate change in Africa: crises of adaptation and human security in the 21st century'. Environmental economics. (2015) vol 6(2) 132–140, pp 138.

[23] Daniel Scott, C. Michael Hall, and Stefan Gossling. *Tourism and Climate Change: Impacts, Adaptation and Mitigation* (Routledge, 2012).

it goes beyond 2°C worldwide warming.[24] Climate change is now part of our daily existence, with not a single day passing without media commentary (print press, television and radio stations) on climate change and its deadly consequences. The United Nations has warned that the devastating effects of climate change, particularly resulting from emissions from Western international locations, will hit Africa the hardest. It is critical to notice that the effect of weather change in Africa is deadlier than originally estimated. Some 70 million humans are in danger from rising sea levels, whilst droughts, which have overwhelmed the Horn of Africa with increasing occurrences, will be greater.[25] Consequently, not only have people developed concerns on the subject of atmospheric change, but it has raised the most important concerns for business worldwide through the activities of the Intergovernmental Panel on Climate Change (IPCC), set up in 1988 by the World Meteorological Organisation and United Nations Environment program. Studies have additionally shown that climate change has poor effects on tourism.

However, developing nations experience the effects with greater intensity, not only due to the fact they make greater contributions to climate alteration but also because they lack the economic, social, and political capability to address the results of climate change in a timely manner. Weather changes are predicted to result in the rise of temperatures, greater sporadic rainfall styles, and frequent droughts. These changes are already occurring and judging from the lessons learned from international locations already affected by water scarcity and so forth, the influences of climate alterations are expected to have negative consequences on all sectors of the financial system.[26] Viner observes that few guides and sparse literature address these climatic effects on tourism and calls for continuous studies on weather change and tourism.[27] This research is a contribution in response to this call.

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[24] Burke, Marshall, W. Matthew Davis, and Noah S. Diffenbaugh, 'Large potential reduction in economic damages under UN mitigation targets' (2018) 557 (7706) Nature 550.

[25] Institute of Environmental Management and Assessment (IEMA), 2016. Environmental Impact Assessment Guide to: Delivering Quality Development. IEMA - Institute of Environmental Management and Assessment http://www.iema.net/ accessed 10 October 2024.

[26] Institute of Environmental Management and Assessment (n21).

[27] RM Viner, MM Haines, SJC Taylor, J Head, R Booy, S Stansfeld. 'Body mass, weight control behaviours, weight perception, and emotional wellbeing in a multiethnic sample of early adolescents.' International journal of obesity. (2006) Vol. 30(10) 1514–21. pp 1517.

Moreover, Wall noted that tourism and recreation are important economic contributors to trade,[28] mainly in wetland regions, including the Bojanala Platinum District Municipality. Therefore, there are frequent financial activities related to the seasons and anything that hinders the operation of the seasons can have notable influences on tourism activities there. It accordingly means that, in wetlands, recreation areas consisting of the Bojanala Platinum District Municipality are probably threatened by growing sea impacts. As a result, this review centered on the effects of climate change on tourism in the municipality is particularly appropriate.

Scott, looking at Weaver, stated that sustainable tourism's present-day increasing engagement with weather change will not necessarily gain tourism sustainability.[29] Scott carefully analysed and responded to the extreme interrelated impacts supplied with the aid of Weaver to support his conclusion. He disproved commonplace climate technology myths that persevere to hinder technological development and complex debates over climate change coverage responses and refuted claims of compromised and inaccurate research findings. Weather alteration studies revealed a deficiency beyond the visualisation of sustainable tourism that specifically centered on problems relating to vacation destinations and highlighted the need to effectively account for the environmental and social improvement and relevance to improve sustainable tourism research. For Scott tourism is presently grouped with most of the monetary sectors taken into consideration but not prepared for the dangers and opportunities offered through climate change. This is despite the industry seeking to expand the important technical know-how to teach corporations, communities, and government about issues of possible response to policy formulation. Failing to address climate change impacting on tourism-by-tourism enterprises and/or researchers will spell doom for the tourist industry. Consequently, greater attention to and more focused studies on weather change effects on tourism inside the Bojanala Platinum District Municipality are essential.

In a comparable study, Hall contended that sustainable tourism is highly sought after whilst there is high participation among research academic students, authorities, industry, and decision-makers concentrating on it.[30] This needs to take

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[28] Geoffrey Wall, 'Implications of global climate change for tourism and recreation in wetland areas'. Climatic Change (1998) Vol. 40 pp 378.

[29] David Weaver, 'Can sustainable tourism survive climate change?.' Journal of Sustainable Tourism (2011) Vol 19(1) 5–15. p 15.

[30] C. Michael Hall. 'Framing behavioral approaches to understanding and governing sustainable tourism consumption: Beyond neoliberalism, "nudging" and "green growth"?' Journal of Sustainable Tourism (2013) Vol. 21(7) 1109.

into account, however, the continuing poor impact of tourism on the environment. With reference to climate change, Hall supported Weaver and Scott by mentioning that sustainable tourism frequently denies the importance of environmental policy actors.[31] Hall et al. cited that, with the undeniably considerable influence of global tourism, tourism must be measured in the framework of its wider impact on the tourism machine.[32] It thus implies that climate change effects on tourism must be tackled and addressed with the seriousness it merits, and this follows for the Bojanala Platinum District Municipality. High emissions associated with tourism in the Bojanala Platinum District Municipality ought to be put in check if weather change influences are to be minimised.

Climate Change in Bojanala Platinum District Municipality

Historical Environment in Bojanala Platinum District Municipality

Bojanala is located in the Highveld region of the Northwest Province and encounters regular Highveld environment conditions: warm to blistering summers and moderate to cool winters. As far as temperature, historically, there has been a solid irregularity between the colder time of year and late spring months.[33] As outlined in Figure 2, the coolest month is July while the most smoking months are December and January.[34] Likewise with the temperature, generally, precipitation has additionally been firmly attached to the seasons. Bojanala encounters high precipitation in the mid-year months, with a large portion of the yearly precipitation falling between November and March, fundamentally because of thunderstorms, with the most elevated measure of precipitation falling between December and January (the wettest month). Almost no precipitation happens throughout the cold weather months (May-August). The driest month is July. The yearly precipitation normal for the locale is around 650 mm. Bojanala has experienced exposure to patterns of delayed dry spells, going on for an extended period. Extraordinary climate conditions are incredibly uncommon; however, increases may be anticipated because of environmental change.[35]

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[31] David Weaver, 'Can sustainable tourism survive climate change?.' Journal of Sustainable Tourism (2011) Vol 19(1) 5–15. pp 9.

[32] C. Michael Hall, Daniel Scott, and Stefan Gössling, 'The primacy of climate change for sustainable international tourism.' Sustainable Development (2013) Vol 21(2) 112–121. pp 119.

[33] Climate Information Portal – CIP. Home - Climate Information Portal http://cip.csag.uct.ac.za/webclient2/application/ accessed 10 October 2024.

[34] Climate Information Platform (CSGA UCT) https://www.csag.uct.ac.za/climate-services/cip/ accessed 20/07/2024.

[35] Climate Information Portal (Fig 2) (n34).

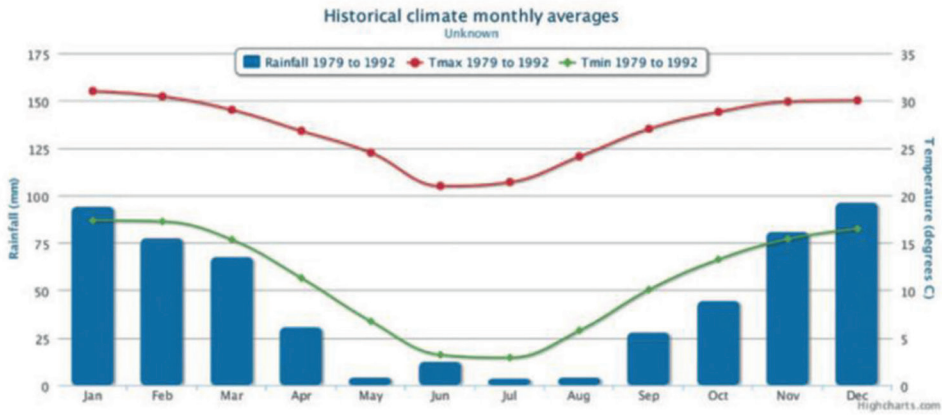

Figure 1. The typical environment of Bojanala Platinum District Municipality
Source: CSAG Environmental Information Portal.

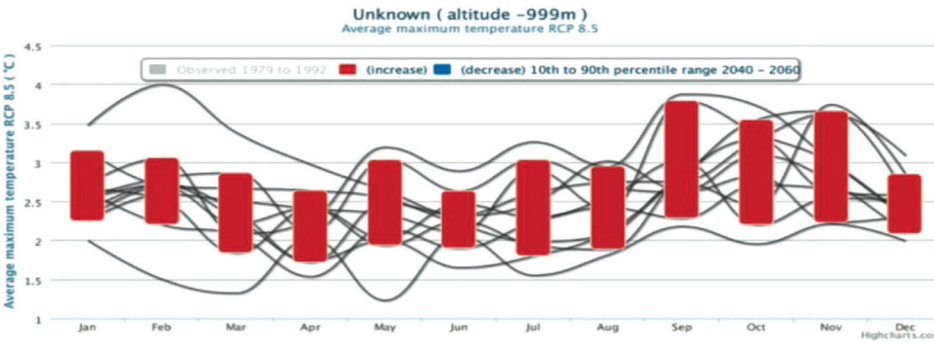

Figure 2. The expected changes in normal most extreme temperature designs for Bojanala Platinum District Municipality
Source: CSAG Environmental Information Portal.

Climate change and wetlands in the Bojanala Platinum District Municipality.

Projected Environmental Change in the Bojanala Platinum District Municipality

The Climate Systems Analysis Group (CSAG) from the University of Cape Town (UCT) has built up the Climate Information Platform (CIP) which endeavours to provide environment-related data. The CIP runs a progression of environment

models which all together give an information base of authentic environment designs just as future projections for locales and regions throughout the world.[36]

Temperature

As far as temperature is in issue, the environment models concur that warming inside the Bojanala Platinum District Municipality is inevitable and that there will be a general expansion in normal month-to-month temperatures of 1.5 – 2.5°C. Summer temperatures will increase somewhat more than the colder time of year temperatures. The mid-year most extreme temperature reach will increase marginally more than the base temperature range with a related expanded danger of warmth waves.[37]

Rainfall

Regarding precipitation, the environment models concur that shifts in the recorded precipitation examples will assuredly happen. The models disagree on the heading of progress and thus, there is uncertainty concerning whether there will be an increase or a reduction in yearly precipitation in the area. In spite of this uncertainty, models demonstrate that there will be a move to commonly drier conditions, especially in the cold weather months. Models likewise show that there will be a move in the circumstance of occasional precipitation just as in the precipitation designs. The precipitation amount will probably continue as before or diminish in general. There could be an increment in the recurrence and power of periods of precipitation throughout the late spring months. It is expected that there will be a worsening of the current environmental conditions.

Impacts of Climate Change in Bojanala Platinum District Municipality

An unstable environment implies that the chronicled irregularity, precipitation, and temperature designs at this point do not make a difference. By and large, more sweltering days will occur consistently, just as will an increased probability of blistering spells and warmth waves occurring more frequently from time to time in the late spring months. The changes in precipitation designs imply that subsequent effects could go one of two different ways.[38] If there is an increment in yearly precipitation, there will likewise undoubtedly be an increment in the

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[36] Climate information Portal (n34).

[37] Climate information Portal (n34).

[38] See Fig 3 CSAG Climate Information Portal (http://cip.csag.uct.ac.za/webclient2/application/).

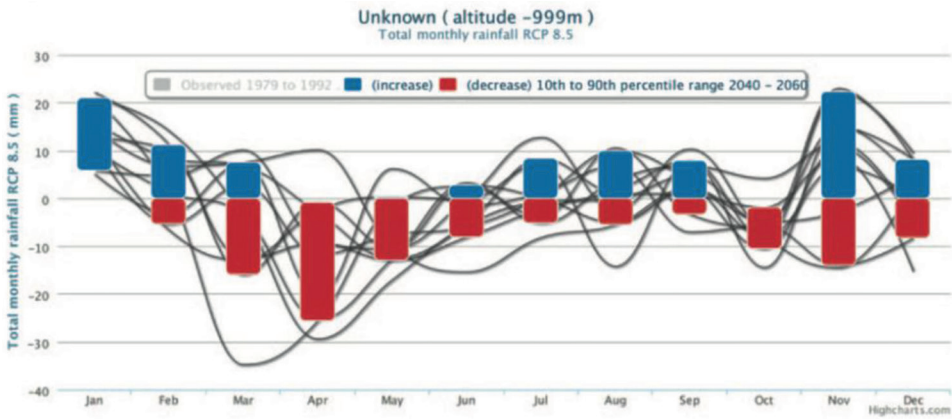

Figure 3. The expected changes in absolute month-to-month precipitation designs inside Bojanala Platinum District Municipality
Source: CSAG Climate Information Portal (http://cip.csag.uct.ac.za/webclient2/application/).

greatness and recurrence of thunderstorm periods (for example more serious tempests happening all the more frequently) bringing about an expanded number of yearly flooding episodes (and likely expanded seriousness), especially in the cold weather months. If there is a reduction in precipitation, there will be an expanded number of yearly dry days bringing about a resulting expanded danger of water shortage and dry season just as more extraordinary fires happen throughout the locale. To put it plainly, environmental change in the Bojanala Platinum District Municipality will bring about a compounding of the current effects happening in the area. Thus, the district ought to continue preparing for chronicled environment-related effects while being careful that these effects will turn out to be more serious over the long run.

Mitigation and Adaptation Strategies

In the previous few years, coping strategies (mitigation and adaptation) have been two significant methods of attempting to oversee environmental change impacts.[39] Alleviation is a methodology used to lessen the impacts of environmental change on the tourism industry by either diminishing ozone-harming substance discharge

[39] J Arjan Wardekker. Climate change impact assessment and adaptation under uncertainty. PhD dissertation. Utrecht University (Utrecht 2011).

or by improving ozone-depleting substance sinks. These are the significant worries of the developed country, while the variation of environmental change impacts is the primary worry of the developing country.[40] Generally, the capacity for variation and relief in the worldwide reaction to environmental change is a significant one. Decision-makers, for the most part, consider these to be measures as reciprocal to each other, on the grounds that the ideal strategy response envelopes both transformation and relief. In any case, financial, variation, and relief will probably be choices. This implies that a decrease in the expense of one will likely prompt an abatement popular for the other (Buob and Stephan 2013). Variation and alleviation are correlative, exchangeable, or self-ruling of one another (Rogner et al 2007). At the point when they supplement one another, variation decreases the expenses of climatic change impacts and afterward diminishes the longing for relief application.

Adaptation Methodologies

Environmental change adaptation is a system intended to adapt to the impacts of environmental change (IPCC, 2014b). The point is to diminish defenselessness and experience the unfavorable impacts of environmental change (e.g., ocean level rise, more exceptionally limited climate occasions). It likewise includes finding the potential advantages related to the chances introduced by environmental change (such as longer developing seasons or expanded yields in certain territories). Environment adaptation implies making moves to deal with the impacts of air change by decreasing helplessness and openness to its risks and misusing likely advantages. Some climate change adaptation strategies/approaches are as follows:

Behavioural

Global warming is expected to affect the tourism industry unfavorably.[41] The immediate and unintended impacts of the tourism industry will influence the

[40] O Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen , S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx. IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (1st edn, CUP, 2014).

[41] Murray C. Simpson, Stefan Gössling, Daniel Scott, C. Michael Hall, and Elizabeth Gladin, 'Climate change adaptation and mitigation in the tourism sector: frameworks, tools and practices.' UNEP, University of Oxford, UNWTO, WMO: Paris, France. (2008).

nature of the tourism industry product of a selected destination.[42] However, the climate is the main consideration for visitors to go to a tourism industry destination,[43] but according to the report,[44] commissioned by the Deutsche Bank, due to tourists changing travel configurations, the climate will produce 'winners' and 'losers'.[45] With accurate weather forecasts and information, tourists can make adequate travel plans and arrangements.

Adaptation Measures by Organizations

A significant number of adaptation-related articles center on the tourism industry organizations, since organizations structure a core component of the tourism industry. The most talked about adaptation approaches are the endeavors to enhance items, change the business environment, and the utilization of counterfeit snow. These actions are fitting for ski resorts, which are the primary focal point of the tourism industry and environmental change-related articles for the most part. Around about 40% of the experiential papers in the CABI Direct information base of the tourism industry and environmental change center around ski resorts.[46] Hall noted that the consciousness of environmental change consequences for the ski business is adequately sufficient, while the mindfulness on the issue of versatile limit of resorts, by and large, is not adequately sufficient, mirroring the overall need for real transformation. The expansion of the tourism industry items has been presented as a potential adaptation technique and is frequently acknowledged as an adequate coping measure that can restrict affectability to financial and different emergencies.[47] For example, give a perspective on the adaptation system by

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[42] Daniel Scott, C. Michael Hall., Stefan Gossling, 'Tourism and Climate Change: Impacts, adaptation and mitigation. (Routledge 2012).

[43] Jarkko Saarinen, Wame L. Hambira, Julius Atlhopheng, and Haretsebe Manwa, 'Tourism industry reaction to climate change in Kgalagadi South District, Botswana.' Development Southern Africa. (2012) Vol. 29(2) 273–285. pp 280.

[44] Philipp Ehmer, Eric Heymann, Tobias Just, Gerda Fuchs-Sobolew, Norbert Walter. 'Climate change and tourism: Where will the journey lead.' Deutsche Bank Research. (2008).

[45] Jacqueline M. Hamilton, David J. Maddison, Richard SJ Tol. 'Climate change and international tourism: a simulation study.' Global environmental change. (2005) Vol. 15(3) 253–266. pp 260.

[46] David Weaver, 'Can sustainable tourism survive climate change?.' Journal of Sustainable Tourism (2011) Vol 19(1) 5–15. pp 15.

[47] Ghislain, Dubois, Jean-Paul Ceron, 'Tourism and climate change: Proposals for a research agenda' Journal of Sustainable Tourism. (2006) Vol. 14(4) 399–415. pp 399.

hoteliers to seashore disintegration in Mexico.[48] The specialized transformation that occurs through seashore modernisation is relative at the present moment, however, the work to rebrand the destination and grow additional administrations can have long-term beneficial outcomes.

Notwithstanding broadening, adapting instruments frequently coordinate fake snowmaking strategies, realizing that in colder times of year, the tourism industry (and summer skiing tourism industry) is the most susceptible to environmental change. In spite of the fact that snowmaking and spatial changes might be amazingly beneficial and financially suitable to specialist organizations, they may not be focused on socio-environmental and natural manageability as a result of undeniable degrees of energy utilization and the environmental impacts included,[49] returning to the principal issues of deficient supportability in transformation.[50] The significant need to draw water for snowmaking from nearby lakes, dams, and streams and to develop new pipelines and repositories may affect different rudiments in the zone like agribusiness, and result in negative biodiversity impacts in neighborhood.[51]

Change in Destination and Local Designs of the Tourism Industry

Concerning changes in site location, adaptation needs to focus more broadly than singular tourism industry organizations and exercises. The destination is ordinarily a troublesome idea as it can mean a fluctuating scope of spatial scales and tasks in the tourism industry: landmasses, states, territories, regions and other managerial units, traveler resorts, or even, specifically, vacationer items.[52] Here, the genuine definition or level of investigation is not the fundamental issue as the possibility of adaptation covers different topographical scales and units. Nonetheless, in certain zones, there are significant covers between a specific activity, for example, downhill skiing and a destination scale, for example, a skiing resort

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[48] Christine N. Buzinde, David Manuel-Navarrete, Eunice Eunjung Yoo, Duarte Morais. 'Tourists' perceptions in a climate of change: Eroding Destinations'. Annals of Tourism Research (2010) Vol. 37(2) 333–354. pp 333.

[49] Weaver (n40).

[50] W. Neil Adger, Jon Barnett, 'Four reasons for concern about adaptation to climate change.' Environment and Planning A (2009) Vol. 41(2) 2800–2805. pp 2801.

[51] Clare Morrison, Catherine M. Pickering, 'Perceptions of climate change impacts, adaptation, and limits to adaption in the Australian Alps: the ski-tourism industry and key stakeholders'. Journal of Sustainable Tourism. (2013) Vol. 21(2) 173–191. pp 191.

[52] Saarinen, Jarkko, 'Destinations in change' The transformation process of tourist destinations'. Tourist Studies. (2004) Vol. 4(2) 161–179. pp 170.

zone, the featuring of site adaptation is on the more extensive underlying impacts and changes brought about by climatic change to an unequivocal territory.[53]

Developing Approaches and Systems

The adaptation strategy structure of the United Nations Development Program (UNDP)[54] depends on four standards: putting transformation in an improvement perspective; recognizing that transformation occurs at different levels, particularly at the nearby level (base up); expanding on present versatile experience to adapt to the future environment and that transformation will be a persistent interaction. Inside the tourism industry setting, the main UNDP rule can be carried out by improving the part of public approaches in arranging and consolidating them into territorial tourism industry programs. This would yield benefits by making mindfulness and mounting tension on individuals to make proactive moves against climatic changeability, despite the fact that the absence of consideration of the tourism industry as a financial sector in public arrangements can influence the improvement of environmental change-related approaches in the area.[55]

Training is critical to change, thus unique political and scholastic establishments need to be expected to play an important part in adjusting to environmental change.[56] For example, the research outcomes ought to be made accessible to all.[57] As environmental change happens through broad warming as well as an increment in the rate and power of climate limits,[58] the strategies and existing enactment

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[53] United Nations World Tourism Organisation. "Climate Change and Tourism - Responding to Global Challenges". Report. (2008) <https://www.unwto.org/archive/global/news/2011-08-16/climate-change-and-tourism-responding-global-challenges> accessed 19 April 2024.

[54] Bo Lim, Ian Burton, Elizabeth L. Malone, Saleemul Huq, Erika Spanger-Siegfried. 'Adaptation Policy Frameworks for Climate Change: Developing Strategies, Policies and Measures'. Press Syndicate of the University of Cambridge. (2004) pp 20.

[55] Susanne Becken, Ross Clapcott, 'National tourism policy for climate change.' Journal of Policy Research in Tourism, Leisure & Events. (2011) Vol. 3(1) 1–17. pp 17.

[56] Karl W Butzer, 'Adaptation to global environmental change'. The Professional Geographer (1980) Vol. 32(3) 269–278.

[57] Kaarina Tervo-Kankare, 'The consideration of climate change at the tourism destination level in Finland: Coordinated collaboration or talk about weather?' Tourism Planning & Development (2011) Vol. 8(4) 399–414. pp 414.

[58] C.B. Field, V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, P.M. Midgley. 'Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation.' Intergovernmental Panel on Climate Change. (2012) pp 582.

ought to have the option to address these issues proactively to establish catastrophe readiness as opposed to responding to these occurrences ad hoc. An adaptation strategy on any scale cannot be restricted to tending to normal anticipation of hazards, and adaptation coping systems should be multi-sectoral.[59]

Indigenous Information

Table 1 below shows the assemblage of some environmental change variation estimates utilized in the tourism industry.

Table 1. The assemblage of some environmental change variation estimates utilized in the tourism industry.

Nature of adaptation	Tourism business	Tourism industry association
Behaviour	GHG emissions offset initiatives	GHG emissions offset initiatives Water conservation programmes
Research	Identifying suitable site locations (tourism product specific)	Identifying tourist and knowledge gaps Assessing awareness of businesses to climate change adaptation options
Managerial	Diversification of products and markets Promoting regions that have not been negatively impacted Closing during off-peak periods	Training seminars on climate change adaptation Using seasonal forecasts to guide marketing efforts Encourage sustainable environmental management
Education	Holding educative seminars for employees about climate change and adaptations	Public education through awareness campaigns
Technical	Production of artificial snow Water recycling initiatives Infrastructure designed to withstand extreme events (cyclone-proof structures)	Monitoring and early warning technology (to inform tourism businesses) Provide up-to-date information on adaptation methods and techniques

[59] M.C. Tirado, J.L. Vivero-Pol, R. Bezner Kerr, and K. Krishnamurthy, 'Feasibility and effectiveness assessment of multi-sectoral climate change adaptation for food security and nutrition.' Current Climate Change Reports (2022) Vol. 8(2) 35–52. pp 40.

Nature of adaptation	Tourism business	Tourism industry association
Policy	Hurricane interruption guarantees Complying with environmental policy and regulations	Setting up adaptation funds to implement adaptation strategies. International cooperation to lobby for GHG emission reductions through adaptation and mitigation

Source: UNWTO-UNEP-WMO.[60]

Mitigation Strategies

In this investigation, "Alleviation of environmental change includes making moves to diminish ozone-harming substance outflows and to improve carbon sinks". Relief is viewed as the endeavors applied to diminish or forestall the outflow of ozone-depleting substances, or to retain the gases previously discharged, in this manner restricting the size of future warming.[61] Accordingly, it requires the utilization of new advances, clean fuel sources, diminished deforestation, and changes in individual and general conduct. Four principle significant alleviation procedures to address the decrease of the discharges of GHG can be recognized:

1. Reducing energy is a significant part of moderation, which could be accomplished by changing area improvement and showcasing (visit administrators), area decisions (sightseers) and giving elective types of transport from vehicle and airplane to rail, boat and mentor. Visit administrators can likewise expand the time of stay, consequently diminishing the carbon impression each vacation day.
2. Improving energy effectiveness could likewise diminish energy interest. New innovations in flying and electric vehicles could prompt decreases in discharge per kilometer of movement of 32% somewhere in the range of 2005 and 2035,[62]

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[60] Murray C. Simpson, Stefan Gössling, Daniel Scott, C. Michael Hall, Elizabeth Gladin, 'Climate change adaptation and mitigation in the tourism sector: frameworks, tools and practices.' UNEP, University of Oxford, UNWTO, WMO: Paris, France. (2008).

[61] R.K. Pachauri, L.A. Meyer. Climate Change 2014: Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Intergovernmental Panel on Climate Change, Geneva, Switzerland, (2014) pp 151.

[62] P.M. Peeters and J. Middel, 'Historical and future development of air transport fuel efficiency', Transport and Climate Change (TAC) Conference, Oxford, 25–29 June 2006; and see also P.M. Peeters and J. Middel, Climate Change and Tourism: Responding to Global Challenges. October 2006, Microsoft Word - Davos-Report_Summary_English_02-11-2007_web.doc (uncclearn.org) accessed 10 October 2024.

while innovation in vehicle transport has the capability of diminishing 7% of all traveler outflows of carbon dioxide.[63]

3. Increase environmentally friendly power in the tourism industry. Basically, all types of environmentally friendly power like breeze, photovoltaic, sun-oriented, geothermal, biomass, and energy recovery from waste are essential to the tourism industry. This technique is by all accounts critical for island destinations where petroleum product energy supplies are costly to access.
4. Sequestering of taking carbon dioxide (CO2) through sinks is another technique.[64] Carbon dioxide can be saved in biomass (through forestation and keeping away from deforestation), in seas, and in topographical sinks (drained gas fields).[65] By and large, this has been drilled in the tourism industry through carbon pay or carbon balancing, implying that similar measures of GHG emanations produced by a specific action (such as flight) would be decreased elsewhere by the planting of more trees.

The tourism industry, however sensitive and powerless against environmental change on destination and organizations, likewise delivers ozone-harming substance (GHG) discharge from transport and other tourism-related exercises which adds to environmental change. In this manner, government and the tourism industry administrators and partners have upheld carbon moderation systems dependent on eco-proficiency exercises to diminish GHG outflows and tourism working expenses, with adaptation measures to deal with the biophysical impacts of environmental change on destination.[66] Nonetheless, tourism industry administrators have been reluctant to expend assets to carry out alleviation measures despite uncertainty and doubt encompassing environmental change.[67]

Numerous world tourism industry associations reports clarify rules and measures about environmental change's ramifications (World Tourism Organization

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[63] World Tourism Organization, UNWTO Tourism Highlights. UNWTO (2007), Madrid, DOI: https://doi.org/10.18111/9789284413539 accessed 26 February 2024.

[64] UNWTO and UNEP, 2080 (CO2) in carbon sinks (UNWTO and UNEP, 2008).

[65] Susanne Becken, 'How tourists and tourism experts perceive climate change and carbon-offsetting schemes.' Journal of Sustainable Tourism. (2004) Vol. 12(4) 332–345. pp 334.

[66] Susanne Becken and John Hay. Climate Change and Tourism: From policy to practice (Routledge, 2012); Stefan Gössling, Daniel Scott, Michael Hall, Jean-Paul Ceron and Ghislain Dubois, 'Consumer behaviour and demand response of tourists to climate change.' Annals of tourism research. (2012) vol 39(1) 36–58 pp 40.

[67] Stephen Turton, Tracey Dickson, Wade Hadwen, Bradley Jorgensen, Tien Pham, David Simmons, Pascal Tremblay, Robyn Wilson. 'Developing an approach for tourism climate change assessment: Evidence from four contrasting Australian case studies.' Journal of Sustainable Tourism. (2010) Vol. 18(3) 429–447. pp 435.

[WTO] and United Nations Environment Program [UNEP], 2008) and list measures for the tourism industry to diminish its fossil fuel byproducts to relieve environmental change on the tourism industry (World Travel and Tourism Council [WTTC], 2009). The reports note the worldwide impacts of climatic change on the tourism industry destination, likely impacts on traveler interest, and commitments of the tourism industry to worldwide fossil fuel byproducts and layout alleviation techniques and ways to deal with them.[68] Organization for Economic Co-operation and Development (OECD) and UNEP on Environmental Change and Tourism Policy, contend that the tourism industry and governments should take extra measures to diminish fossil fuel byproducts from movement (travel by air, land, and sea). Just a single third of OECD nations have set up this approach to decrease the tourism industry emanations. What is more, enviornmental change can have indirect results on the genaral public. This is shown in Table 2 below.[69] It is accepted that environmental change impacts and the resultant moderation endeavors will have critical monetary implications and consequently compromise future financial development in various economies around the planet.[70]

Table 2. The general view of possible mitigation measures

Action/ Actor	Air Transport	Car Transport	Train/Coach/ Transport	Destination	Accommodation	Activities
Tourist	Minimise air transport; Choose pro-environmental airline; Offset Emissions	Transport Use energy efficient cars (<120g CO2/km)	Use train & coach	Stay longer; Favour closer Destinations	Choose environmentally certified hotel	Avoid energy intense activity, for instance such involving transport (helicopter Flights, etc.)
Tour operators	Cooperate With pro-environmental airline; Offer carbon offsetting	Promote the use of small, environmentally friendly Cars	Develop packages based on train/ coach transport and other carbonsmart products	Offer destinations close by; Provide carbon labelling	Cooperate With certified hotels	Offer activities that do not involve transports, particularly flights

[68] UNEP & WTO Climate Change and Tourism: Responding to Global Challenges. <https://ocm.iccrom.org/documents/unep-wto-climate-change-and-tourism-responding-global-challenges> accessed 28 February 2024.

[69] WTO & UNEP, Trade and Climate Change. A report by the United Nations Environment Programme and the World Trade Organization. (2008) <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.wto.org/english/res_e/booksp_e/trade_climate_change_e.pdf> accessed 28 February 2024.

[70] Murray C Simpson, Stefan Gössling, Daniel Scott, C Michael Hall and Elizabeth Gladin, 'Climate change adaptation and mitigation in the tourism sector: frameworks, tools and practices' UNEP, University of Oxford, UNWTO, WMO: Paris, France (2008).

Action/ Actor	Air Transport	Car Transport	Train/Coach/ Transport	Destination	Accommodation	Activities
Destination	Restructure	Promote	Cooperate with	Involve all	Promote the use	Develop
Managers and Planners	marketing (ecoefficiency); Consider domestic tourism; Increase length of stay; Focus on Revenue, not growth.	public transport systems; eventually small cars	National railways systems and coach operator to offer attractive transport solutions	actors to engage in action to become sustainable destination	of environmental management systems and eco-certifi –cations	activities that are low-carbon

Source: UNWTO-UNEP-WTO.[71]

Theoretical Framework

The significance of a hypothetical structure is to make accessible a hypothesis that underpins a proposed research study. A straightforward evaluation of climate change's impacts on the tourism industry in the Bojanala Platinum District Municipality recommends the utilization of some hypothetical strategies as an insightful structure. According to Higgins and Moore, "theoretical framework helps to explain the connections between the features and factors necessary to the research problem".[72] Theories like the Critical Theory, Green Theory, Vested Interest Theory, Crisis Theory, and Resilience Theory would be effective in a study of this nature.

RESEARCH METHODOLOGY

Methodology deals with accurate and reliable data collection. Research methodology assists in collecting correct and dependable information and explains how the research is classified in units to enhance data analysis.[73] The motivation behind the investigation was to decide the impacts of environmental change on the tourism industry area of the Bojanala Platinum District Municipality. This section traces the cycle of how information for this investigation was acquired. The research provides an analysis of environmental change consequences for the tourism industry in the Bojanala Platinum District Municipality. It examined the different adaptation and mitigation procedures and cycles drawn in by the Bojanala Platinum

[71] Simpson (n64).

[72] Patricia A Higgins, M Shirley Moore. 'Levels of theoretical thinking in nursing'. Nursing Outlook (2000) Vol 48(4) pp 180.

[73] Zahri Yunos, Rabiah Ahmad. 'The application of qualitative method in developing a cyber terrorism framework.' Proceedings of the International Conference on Economics, Management and Development, (2014) 133–137. pp 134.

District Municipality to guarantee legitimate measures were adopted to limit the environmental change impacts.

The research proceeded by way of a qualitative method. This method was chosen as it helped to collect extensive information and understanding of human behavior and the environment bringing about such behaviour. This helped in the collection of samples by asking in-depth questions that assisted in inquiring into the impacts of environmental change on the tourism industry in the Bojanala Platinum District Municipality.

Data Sources and Collection

Interviews

An open-ended interview was used as a reliable mechanism for qualitative data collection, allowing obtaining reliable observations from the perceptions of the people, descriptions of situations, and analysis of meanings to realities. Punch stated that, for one to appreciate the views of another person pertaining to a particular circumstance: "They will be asked…..and in a manner to make the express themselves in their own way (how they are primarily affected) and in a depth, which addresses the rich context that is the substance of their meaning".[74]

Data Collection

There are two important data collection methodologies in any given social science research.[75] One is the qualitative research methodology which involves the use of primary and secondary sources of data collection. By choosing this research approach, the researcher gains profound insight into information relevant to the research. Interviews and observations are classical examples of the primary data collection method, while the collection of information needed from existing data is an example of the secondary data collection method.

DATA ANALYSIS

Information investigation was applied here to indicate the stages in dissecting the different types of subjective information accumulated. The explanation is "to bode

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[74] Keith F Punch, *Introduction to social research: Quantitative and qualitative approaches* (Sage Publishers 2013).

[75] Ranjit Kumar, *Research methodology: A step-by-step guide for beginners* (Sage Publishers 2018).

out of text and picture information".[76] Data analysis in qualitative research can simultaneously go together with other parts of developing the study, such as data collection and compiling the findings. The researchers can analyse the interview material collected earlier, while continuing to conduct interviews, by writing memos that will form part of the narrative in the final report. This research used the content analysis method to identify, analyse and summarise message contents from books, documents, journals, and interview reports.

STUDY AREA

The Bojanala Platinum District Municipality is a class C Municipality. District C comprises a region that has a civil leader and legislative authority in an area that incorporates more than one municipal authority. It is circled and surrounded by natural and characteristic bushveld vegetation. The region has water exercises, mountain sports, parasailing, climbing trails, an expanding, linkway, untamed life relaxation, and a globally acclaimed complex known as the Sun City/Lost City complex with two fairways, a 6000-seater Super Bowl, and the biggest gambling club and game auditorium in South Africa.

CONCLUSION

For many years, the tourism sector in the Bojanala District Municipality has experienced climate change and its menace. The historical foundation of environmental change in the tourism industry and the connections among them are vital to understanding the impact of climate change and how environmental change would, later on, influence the travel industry if not checked. In addition, this article explained through the study upon which it is based how the effects are the consequences of global warming which consistently overshadow the collective interest of the tourism operators. The delayed consequences of environmental change are looked at in accordance with what the study distinguished from the view of environmental change coping mechanisms, the management, and the methodologies of the actors in the tourism industry.

Therefore, as this article suggests, all tiers of government, including the tourism sector, should increase their efforts towards reducing climate change impacts and resolutely commit themselves to managing the impacts of atmospheric change on tourism. The government should establish an efficient system devoid of

[76] John W Creswell and J David Creswell, *Research design: Qualitative, quantitative, and mixed methods approaches* (Sage Publications 2017).

Figure 4. Map of Bojanala Platinum District Municipality
Source: North West Province map accessible at www.municipalities.co.za.

ego-driven political interference and manipulation of policy decisions and actions that have played out in the efforts to tackle adaptation and mitigation options.