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Tourism and Climate Change Scholarship: Insights from an African Journal

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Abstract

The tourism value chain contributes to climate change (CC), while CC impacts the tourism sector, including nature based destinations, with many regions relying on their environment to attract tourists, such as in Africa. Therefore, there is a need to understand tourism and CC in Africa through the literature, but such scholarship appears to be scarce. Moreover, existing studies are skewed to the global north. However, the study is invaluable to tourism stakeholders in Africa and beyond, as CC is a current issue that requires attention from different disciplines. The study adopted a documentary approach to search for studies in Africa, via a Scopus-indexed African-based tourism journal. A total of 1,298 (N) studies within a given period were screened, of which 11 articles (0.85%) were within the scope of the study. The results indicated that tourism and CC research is limited (0.85% of N) in Africa; existing ones are geographically concentrated in South Africa (SA). Secondly, due to the few journal articles, existing studies adopt more of a documentary method (72.7%), while other methods have 9.1%. The implications of these results were discussed. Nevertheless, the study relied on a single journal; this makes generalization of findings difficult, but its contributions to CC and tourism discourse is germane and relevant to CC and tourism stakeholders.

Keywords: Africa, Climate Change, Development, Environment, and Tourism

Introduction

Africa's pristine lush green flora dotting national parks, game reserves, and fauna comprising the Big Five (elephants, lions, leopards, buffaloes, and rhinoceroses); sand, sun, and alluring coastal areas are tourist attractions. These nature-based resources are developed for tourism purposes, but, tourism is seen as a significant agent in the emission of greenhouse gases (methane, nitrous oxide, hydrofluorocarbons, chlorofluorocarbons, sulfur hexafluoride, nitrogen trifluoride) and carbon monoxide which cause global warming. leading to climate change (CC) with implications for the tourism sector. Climate imbalance is a global threat to any form of human enterprise, including tourism, and it appears to be vulnerable in some regions, including Africa. CC can reverse tourist traffic to any destination. and Africa is no exception. Unfortunately, tourism's contributions to CC appeared to have been given limited attention, as it was seen as a 'white' pollution-free industry, especially in emerging economies like Africa. However, the contributions of CC to destruction, degradation, and negative impacts on tourism resources appear scanty. Secondly, within the literature on CC, tourism and tourism, there are more studies in advanced economies than in the global south, especially in Africa. This gap stimulates this study. Furthermore, it has become necessary to maintain sustainable weather and environment in tourism destinations worldwide. Therefore, there is a need to reduce the principal causative agent-carbon of CO₂ in the atmosphere. This is because; tourism and its value chains contribute to CC [1-4].

Conversely, CC is everybody's concern, as it is a threat to life on Earth, with its effects seen globally. For instance, beach and coastal ecosystems in Africa are likely to be under threat from CC, because, 'increasing climate change threats to

these places are concerning in the form of changing coastal boundaries, sinking islands and seawater intrusion through glacier melting. Glacier melting has contributed to sea level rise by a marked increase of (0.77 ± 0.22) mm/yr in 1991-2004 against (0.50 ± 0.18) mm/yr in 1961-2004'. The rise in sea level may affect the destinations along coast lines in Africa. Siddiqui and Imran explained the value of tourism destinations as therapeutic and invaluable to human health. However, CC induced events, such as unpredictable variation in precipitation models, forest fires, drought, and decrease in rainfall, among others affect tourism and its destinations, with instances in the Mediterranean Islands, Bangladesh, India, and Tanzania. This makes CC and its interplay with tourism worthy of academic exploration of which this study brings preliminary insights. Scholarly attention to tourism and CC seems meager, especially in the Global South. Given the above postulations, it is ideal that a study be initiated to understand research directions, and postulations concerning CC and tourism. This will be done via a journal that is domiciled in Africa, publishes tourism research, and is scopus indexed. Specifically, the study looks at (i) the number of articles published within the confines of climate, CC, and tourism or CC and tourism-related areas from 2018-2024; (ii) the number of countries engaged in writing on CC and tourism or CC and tourism related topics from 2018-2024, (iii) methods used in CC and tourism researches/studies from 2018-2024, (iv) the implications of CC and tourism research within Africa. This study is invaluable to the global discussion on CC and tourism and offer directions for future research. Its implications for academia, policymakers, and tourism promoters cannot be overemphasized [5,6].

Theoretical Framework

Chaos Theory

The term Chaos was derived from the Greek word 'Khaos' meaning 'gaping void' [7]. Chaos theory, here after referred to as CT, is 'a mathematical field of study that states that non-linear dynamical systems that are seemingly random are actually deterministic from much simpler equations' [7]. This is further explained by other scholars, as, to mean, 'small changes in the initial conditions of a system can lead to significantly different outcomes over time'. Biswas et al. gave a lucid explanation of CT, which is based on two main areas, viz; 'the first one is that systems, regardless of their degree of complexity, depend on an underlying overall equation or a principle that governs their behaviour thus making it deterministic, theoretically, which is not due to its instability and presence of a large number of contributing factors. The second main component is the high sensitivity to initial conditions, that a minute change in the initial conditions, such as rounding errors in numerical computation of a certain dynamical system can produce cataclysmic and unpredictable outcomes for that dynamical system'. This suggests, any small change in the atmospheric conditions of a place as a result of natural or anthropogenic actions (i.e., tourism) can cause CC. Conversely, CT appears to fit in this study because it provides a platform to comprehend complex and uncertain issues with the climate system and CC. Second, CT is well documented in tourism studies because of its ability to make meaning of the complexity of the tourism system. And CT is said to be developed through, 'observing weather patterns, but it has become applicable to variety of other situations. Some areas benefiting from CT today are mathematics, geology, microbiology, biology, computer science, economics, engineering, finance, algorithmic trading, meteorology, philosophy, anthropology, physics, politics, population dynamics, physiology, and robotics' including tourism. Therefore, this application reinforces its value in explaining CT in tourism and its relationship to CC [7-9]. The present concern here is that CT provides an explanation of the two major complex variables in this study: tourism and CC. First, both tourism and CC is affected by external forces (man's activities affect and leads to CC; tourism activities affects CC, and CC affects tourism) which CT explained that chaos system are easily influenced by external triggers or factors as 'chaotic systems are unstable since they tend not to resist any outside disturbances but instead react in significant ways. In other words, they do not shrug off external influences but are partly navigated by them'. Therefore, both CC and tourism react to external factors that can trigger changes in both sectors; as such changes are likely to be cataclysmic. It is worth noting that CC can be an external trigger for tourism, and vice-versa. From the CT perspective, within tourism, pollution (i.e., CO₂) of the transportation sector will create change(s) causing CC, and CC will affect a destination and disrupt economic activities and gains. CC has caused alterations in the rise of sea levels and affected different tourism destinations. And tourist destinations in Africa may not be exempted from [6,7].

Literature Review

Climate Change & Tourism

The United Nation's Framework Convention on Climate Change (UNFCCC) defined CC as 'a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. Riedy explained it as follows, "climate is the average of the weather conditions at a particular point on the Earth. Typically, climate is expected in terms of expected temperature, rainfall, and wind conditions based on historical observations. 'Climate change' is a change in either the average climate or climate variability that persists over an extended period'. It is necessary to understand the climate for the easy comprehension of CC. The climate system is mainly 'the totality of the atmosphere, hydrosphere, biosphere, and geosphere and their interactions'. Related to this definition is from Humble, who cited the Intergovernmental Panel on Climate Change (IPCC) 2013 definition, 'Or climate might be understood in a more general scientific sense as a description of the state and dynamics of the physical planetary system which consists of ...five major components: the atmosphere, the hydrosphere, the cryosphere, the lithosphere and the biosphere, and the [evolving] interactions between them'. Understanding CC requires a comprehension of the total components of climate systems, the details of weather and how it is different from climate and how their interactions with ecosystems and humans cause changes in the climate leading to CC, as well as the influence of weather and climate on Earth immensely. The climate system of

Houghton comprises variables such as the atmosphere, ocean, land surface, ice and snow surface (both land and ocean areas), and biosphere (both terrestrial and marine) [13-15]. Figure one (1) shows the interactions and communications in the system. Meanwhile, it is necessary to add, other factors that affect the climate such as 'external' forces or factors such as the sun, earth topography (land and ocean), etc. and other human activities like burning of fossil fuels and cutting of trees (trees absorb carbon monoxide from the atmosphere); if more trees are cut, it increases the presence of CO₂ in the atmosphere, heating the system [14,15].

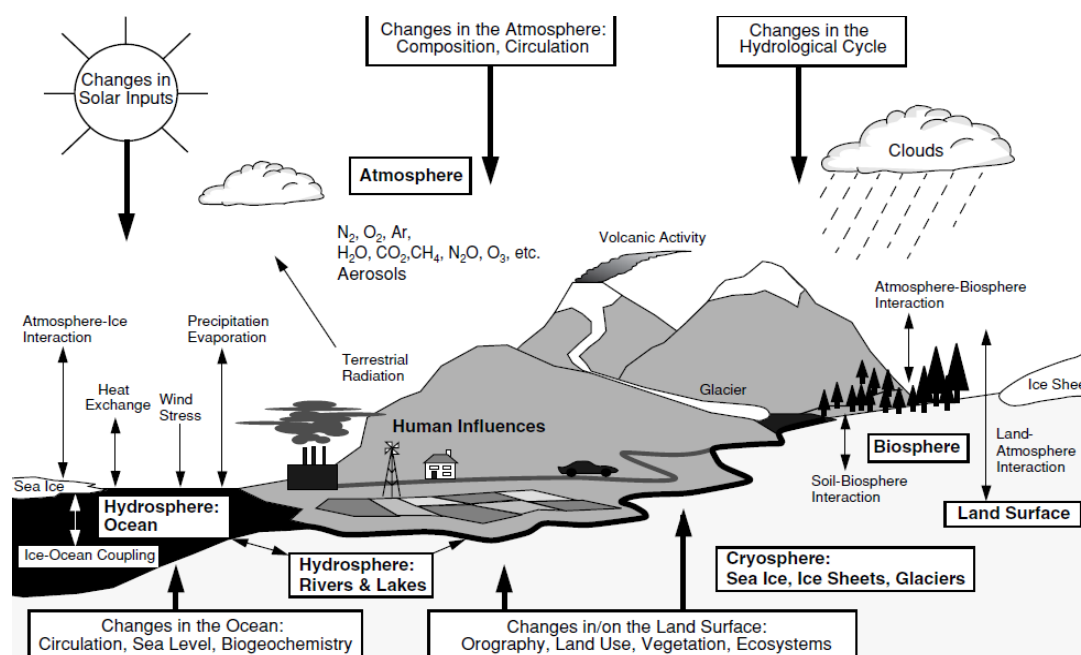


Figure 1: A Schematic View of The Components of The Global Climate System (Bold), Their Processes and Interactions (thin arrows) and Some Aspects that May Change (bold arrows). Source: [14]

Human activities that increase or decrease naturally occurring gases in the atmosphere (see Figure 1) will cause changes, in the climatic conditions of any region of the world. Moreover, climate varies from one location to another, "depending on latitude, distance to the sea, vegetation, the presence or absence of mountains, or other geographical factors. The climate also varies with time from season to season, year to year, decade, or on much longer time scales, such as ice ages. Statistically significant variations in the mean state of the climate or its variability, typically persisting for decades or longer are referred to as "climate change". There are order detailed definitions of CC, but it becomes evident that different scholars and institutions define CC based on disciplinary biases. One basic reality of CC is that it causes a change in the atmospheric condition of the earth. Making it a menace to all lives on Earth, therefore, requires attention by all stakeholders, irrespective of occupation and location. Though the concern of the study is from tourism scholars. Given this background, CC requires an in-depth statistically significant variation in the atmospheric conditions of a place over a long period. Therefore, within the context of this study, CC is taken to mean any observable changes in the atmosphere caused by human activities and natural reactions and has been recorded over a long period, usually between a minimum of ten (10) to hundred (100) years with significant impact (usually negative) on lives on earth such as flooding, acidification of the ocean and loss of different species of aquatic organism, flora, and fauna, among others. Invariably, causes deterioration, pollution, and depletion of natural resources that form natural capital tourism depend on. Because some of the changes in the atmosphere are anthropogenic, the CC can be controlled or reduced. Second this means CC easily affects nature-based tourism resources, such as coastal areas with beaches that can be polluted and washed off due to flooding, and forests that are prone to wildfire and desert encroachment, causing loss of flora, relocation and destruction of different habitats. Empirically, CC has affected tourism destinations, especially coastal cities and island states as shown in different studies. 'The direct effect of climate change might be significant enough to alter major intra-regional tourism flows where climate is of paramount importance, including Northern Europe to the Mediterranean and the Caribbean, North America to the Caribbean, and to a lesser extent North East Asia to Southeast Asia' United Nations World Tourism Organization'. It is clear that CC affects the tourism industry which is composed of different forms and components [14-17].

Tourism

The world apex tourism body, UNWTO, 'Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; resident or non-resident) and tourism has to do with their activities, some of which involve tourism expenditure' [17]. Kushwaha (n.d, 3) added, 'tourism is a sum of all the activities of a tourist who starts his/her journey from origin and visit different destinations

around the globe for several activities like leisure, pleasure, recreation, religion, etc. in which he/she should not be involved in any money-making activities for more than 24hrs and ultimately return back to the place from where he/she has started his/her journey within one consecutive year'. Scholars such as Dilek and Dilek described it as, '...the temporary short-term movement of people to destinations outside the places where they normally live and work, as well as their activities during their stay at these destinations' [18]. However, they were quick to add, 'it should be noted that all tourism should have some travel, but not all travel is tourism' [18]. This means that there are features that make tourism what it is. These features include: '(i) it involves a displacement outside the usual environment, (ii) the travel must occur for any purpose different from being remunerated from within the place visited, and (iii) tourism displacement can be with or without an overnight stay (Kushwaha n.d., 3). Tourism is known to have different components, such as: amenities (infrastructure, public amenities, safety, and security), activities (sightseeing, entertainment, adventure activities, shopping, photography, etc.), accommodation (hotels, motels, resorts, farm houses, service apartments, etc.), accessibility (waterways connectivity, road connections, airlines and railway connectivity), and attractions (beaches, mountains, lakes, snows, waterfalls, national parks, wildlife sanctuaries, museums, amusement parks, monuments, etc.) [19]. These components are usually tagged with the 5As of tourism, although descriptions and details vary from author to another. Scholars like Khan and Banerjee (2020) are of the view that there are six tourism components, which comprise accommodation and catering, information and guiding service, transportation, tour operators, travel agents, and tourist attraction, diagrammatically represented in Figure 2. Authors such as Coromina (2023) believe that tourism components consist of the following: transportation, accommodation, attractions, cuisine and dining, entertainment and events, travel services and infrastructure, hospitality, and customer service.



Figure 2: Components of Tourism Source: Khan and Banerjee (2020)

The above description of tourism shows that it is made of different subsets, linked but different independent units; 'tourism is conceptualized as a system comprised of a series of interdependent parts. This makes it a complex phenomenon, but a highly invaluable tool for achieving economic gains, creating jobs, and conserving the environment. Tourism can assist in achieving the Sustainable Development Goals (SDGs), and UN Tourism seems to be concerned about using it to achieve all SDGs directly or indirectly by setting tourism in the 2030 agenda. The World Tourism Organization and United Nations Development Programme see it as 'a sector that has interlinkages with virtually all other economic sectors, tourism produces profound and wide-ranging impacts across all dimensions of sustainable development' [9,20-22]. In the future, the United Nations Development Programme (UNDP) and UNWTO propose that 'tourism can be managed to advance sustainable development by 2023 and beyond. Tourism can contribute to the SDGs in the areas of mutual understanding, peace, security, cultural values, diversity and heritage, sustainable economic growth, social inclusiveness, employment and poverty reduction, resource efficiency, environmental protection, and climate change. This study is mainly concerned with the interplay between tourism and CC or vice versa [22].

Climate Change Impact on Tourism

Tourism activities affect CC and vice versa. This means that, within destinations, impacts such as rise in sea levels and extreme weather will make coastal destinations vulnerable, putting any existing tourist infrastructure and projects at

risk and the possibility of erosion or submerging of beaches. The likelihood of developing coastal and beach tourism will be reduced because of the dangers associated with CC. Coral reefs are degraded, and some habitats are destroyed, causing loss of aquatic life due to acidification and rising sea temperatures. It is estimated that coral reefs and marine life generate approximately \$11.5 billion annually [23]. This economic value must be sustained, as many nations rely on tourism. However, CC seems to pose a significant threat to tourism. Its likely impact on coastal tourism is enormous. 'Tourism is like many industries, vulnerable to the effects of extreme weather events linked to climate change. Coastal tourism is particularly at risk. Severe storms, with associated winds, waves, rain, and storm surges can disrupt the transport, power, and water supplies that the industry relies on. More frequent and more extreme weather events could lead to increases in insurance premiums, as insurers respond to larger claims. Where risk levels exceed a certain threshold, insurers will no longer offer coverage or will set premiums so high as to be unaffordable to those at risk. This could have serious implications for tourism operators, especially in coastal areas. Poorer countries tend to be less resilient to the effects of extreme weather. By extension, and to the extent that they rely on local infrastructure, the tourism industries in those countries will be more vulnerable than those in richer countries. Extreme weather can influence visitors' perception of the desirability of a particular destination. This indicates that CC can halt tourism growth and development, but, tourism also contributes to CC. Several studies have pointed to tourism as a contributor to CC; this is paradoxical because tourism is a major economic activity in most developing nations, mainly in Africa. Tourism and its value chains emit gases that pollute the environment and worsen CC [4,23-26]. Various CC assessment reports over the years have emphatically pointed to tourism as a significant contributor to greenhouse gas causing different organizations and international bodies to design schemes for the decarbonization of tourism [1]. Therefore, to achieve this, there is a need to look at what different regions are doing in climate change and tourism research, of which this study is one, as CC consequences on tourism are both at the destination and operational level [23]. What are the researches African tourism scholars have done in the face of this threat?

Climate Change and Tourism in Africa

Tourism in Africa rebounded after the late 2019 and early 2020 coronavirus pandemic, with a 7% increase in tourist arrival, and is still growing because of the role tourism plays in the region's economic development. The tourism sector in Africa, which is mainly environmentally dependent, is impacted by CC. The sector is intertwined with CC due to its reliance on nature-based resources, making it vulnerable to the vicissitudes of weather. Any slightest change in temperature, unusual rainfalls, and increase in sea level will alter the natural capital the industry hangs on and the consequence ranges from an unpredictable change in demand and supply to fluctuations in revenue generation [25]. And disruption of local communities' economic value-chain and system that is likely tourism dependent, causing temporary poverty and hunger if unchecked. Several reports have provided empirical evidence of CC in the tourism sector and its resources in Africa. Documentary studies in Africa show 'the review has shown that major tourist destinations in Africa such as wetlands and coastal towns have already shown signs of negative climatic impacts. Such negative impacts include increased temperatures, frequent droughts, coral bleaching, flooding, poor climatic conditions, and extreme weather events [25]. This may imply that the popular seven (7) rivers (Nile, Niger, Senegal, Congo, Orange, Limpopo, and Zambezi) in Africa may be witnessing CC, which will have some impact on Africa's tourism uniqueness and attractiveness if it is not happening already. The literature has shown, that 'Africa has seen a decrease in rainfall over large parts of Sahel and Southern Africa and an increase in parts of Central Africa. Over the past 25 years, the number of weather-related disasters, such as floods and droughts, has doubled, resulting in Africa having a higher mortality rate from droughts than any other region. Therefore, efforts to control and mitigate CC footprints are needed, and to some extent, urgently, due to the inherent value of tourism to the continent. Meanwhile, tourism growth has been positive after the 2019-2020 pandemic. Specifically, international arrivals across Africa are said to have recovered by 96% of pre-pandemic visitors [27-29]. This means that travel has increased, and transportation has been identified as a major contributor to carbon and GHG emissions from the tourism industry. Transport-related CO₂ accounts for 5% of the world's emissions and has the potential to increase to 25% by 2030. Carbon management is a major challenge for the tourism sector (Gössling 2011 as cited in if CC is to be controlled. Unfortunately, despite concerted efforts by the IPCC, UNWTO, and UNEP, Africa designed a blueprint for its future tagged- Agenda 2063 (The Africa We Want) with goal seven (7), specifically discussing how to manage the environment and design climate resilient communities. It appears that efforts to curtail CC through control of carbon emission are facing a 'lack of governance and industry dishonesty, and this appears to be worse in emerging economies like Africa, where robust and rigorous research funding to undertake studies on CC and tourism is limited. This makes research on CC and tourism inevitable, and this study pertains to what is written within and around CC and tourism, using examples from African-based journals [1,4].

Methodology

A documentary approach was used in this study, reviewing previous studies in the area of climate change and tourism and/or examining climate change and tourism-related studies. Articles selected had any of the following keywords: "climate", "CC" and "tourism", and or "climate change" and "tourism related topics" (see, Table 1), and this was done online by skimming and scanning the website (<https://www.ajhtl.com>) of the African Journal of Hospitality, Tourism and Leisure-AJHTL. Journal articles and publications of international organizations such as the UNWTO and United Nations Framework Convention on Climate Change (UNFCCC) were invaluable in this study. It is necessary to review past research in tourism because it helps to improve and understand past efforts in a particular issue (tourism and CC), and such an examination shows the timeline of research and methodological sophistication in the area [30]. A case study was adopted to obtain a deeper reflection and perspective. The case study is ideal because of the limited or

small sample size of data from the AJHTL. Second, a case study is usually adopted where the subject of discussion is poorly explored, with limited empirical studies. Dube (2024) added that Africa seems to be underrepresented in studies concerning CC and tourism or studies related to CC and tourism dimensions and components (i.e. transportation, hospitality, tourists, policies, destinations, etc.). Purposively, AJHTL seems fit for this study for the following reasons: the journal is tourism-based, publishes articles from all regions of Africa, and is a remarkable means for tourism research in tourism, hospitality, leisure, and related areas, mainly for African studies and African researchers. Second, it is Scopus indexed, the Scopus database is of international repute, and contains articles vetted rigorously, while related studies have used the Scopus database. This makes the journal ideal for telling African stories, especially in the areas of tourism and CC. Moreover, academic journals contain a pointer of perspective, area, or trend in a subject or discipline. Articles published in AJHTL from 2018 to 2024 were collected given a total of one thousand, three (1,300), but two (2) articles were excluded, because one had no content, while the second one was removed from the site (probably by the journal administration), therefore, the study used a total of one thousand, two hundred and ninety-eight (N=1,298) (See, Table 1). The journal website could not show other articles from 2017 to 2015 maybe as a result of administrative challenges, corrections, or upgrades of the website during the search for this study (December 6-8, 2024). The articles used comprised those published from 2018 to 2024. It appears that the use of a ten-year gap has been a common practice in tourism studies, and similar studies conducted before the twenty-first (21) century also used ten-year intervals. Moreover, ten years seems to be sufficient for a review in any discipline, since research has grown. The selected range seems recent, and CC has been a topical issue recently, as the International Panel on Climate Change warned about the potential negative impact of CC. Therefore, from 2018 to 2024, tourism scholars are expected to interrogate, comprehend, and forecast what the tourism sector will be like vis-à-vis CC and vice versa. The results were integrated, discussed, and presented as emerging themes. A simple descriptive statistical analysis was performed on the data to concretize the results [3,14,30-35].

S/no.	Year	Topics
1	2023	Bibliometric Analysis of Climate Change, Tourism, and Destination Marketing
2	2023	The Great O.R. Tambo International Airport Flood: Dealing with the Harsh Realities of Climate-induced Extreme Weather Events
3	2023	Climate Change Disclosures by Hotels in the Global South
4	2023	Nature-Based Tourism and Climate Change: The Risk Perceptions of Industry Stakeholders in the Waterberg, South Africa
5	2019	Climate change effects on natural resources availability and tourism sustainability in Maasai Mara National Game Reserve, Kenya
6	2018	The Business of Climate Change: A Perspective of Environmental Performance on the Tourism Industry
7	2018	Perspectives on Second Homes, Climate Change and Tourism in South Africa
8	2018	Sustainable Protection and Preservation of Heritage Sites Attractions from Climate Change in South Africa
9	2018	Proactive responses to mitigate Climate Change impacts by the hospitality sector in South Africa
10	2018	Tourists' knowledge and perceptions on the impact of climate change on tourism in Okavango Delta, Botswana
11	2018	The Significance of Adaptation Interventions as a Tool to Protect the World Heritage Properties from the Negative Impacts of Climate Change
Source: Authors' compilation		

Table 1: List of Selected Articles Within the Search Keywords

Results

Data Presentation and Discussion the Number of Articles Published Within the Confines of Cc and Tourism or Cc and Tourism Related Areas From 2018-2024 In AJHTL

There are one thousand, two hundred and ninety-eight (1,298) in AJHTL from 2018 to 2024 as of December 8, 2024. And eleven (11) publications had topics related to climate, CC, CC, and tourism-related topics, making it less than two percent (2%) of the entire publication within the study period.

Variables	Year 2024	Year 2023	Year 2022	Year 2021	Year 2020	Year 2019	Year 2018	Total
Volumes & Issues	13(1,2, &3)	12 (1,2,3, 4,& 5)	11(1,2,3, &4)	10 (6,5,4, 3, 2, & 1)	9 (6,5,4, 3,2 &1)	8 (1,2,3, 4, & 5)	7(1,2,3, 4, 5 & 6)	-
Special Edition/Issue (SE) and others	Nil	1	2	1	Nil	2	1	7
Topics on Climate Change (CC) with tourism and tourism related topics	Nil	4	Nil	Nil	Nil	1	6	11
Number of publications	76	126	142	125	232	368	229	1298
100%	6%	9.7%	11%	9.6%	18%	28%	18%	100%
Source: Author compilation.								

Table 2: Number of Articles Published Within the Confines of Cc and Tourism or Cc and Tourism Related Areas from 2018-2024 in AJHTL

The only related works published were in 2023, 2019, and 2018, with each having 4, 1, and six publications, respectively. Further details as provided in Table 2.

Interestingly, based on the concern of the study, the year with the highest publication is 2019, and it contributed 28% of the total publications, producing only one (1) publication, while a year before, 2018 was the second highest, producing 229 publications, contributing 18% to six (6) publications. In 2023, 126 (9.7%) produced four articles. This shows that the journal has no special year for publishing articles of concern; rather, whatever researchers contribute is what they publish. However, the pandemic period may have been a time for more studies on climate, using documentary means that are usually easy, cheaper, available, and accessible to existing information. Therefore, this calls for more research, especially empirical studies, training, and orientation about the uniqueness of the African tourism industry and the CC. As more research on CC and tourism is likely to boost a more environment friendly tourism policies and actions. Secondly, these results show a paucity of literature concerning issues of "climate", "CC" and "CC and tourism-related topics" in the journal, and this aligns with previous studies, which decried limited scholarship from Africa. This is worrisome because of Africa's vulnerability to CC issues and the continent's reliance on its natural resources to attract visitors. This also indicates that previous assertions that studies on "climate", "CC" and "CC and tourism-related topics" are mainly skewed towards the global north [4]. A trend that needs attention and possible review. This invariably makes decisions and ideas about climate, CC, and tourism tilted towards the global north, making Africans a mere unproductive destination in knowledge and an ever-willing consumer of ideas that are likely not to be 'workable' or useful in their system. Some scholars did a similar study, and put it as follows, 'documents published are mainly from Europe, which proves the dependency syndrome of Africans, and Asians on Western countries' knowledge and ideas flowing from the North to the South...The same sentiment of the authors from the North dominating research on the three constructs leaves Africa and other continents as mere consumers of knowledge and not creators of knowledge' [3,36].

The Number of Countries Engaged in Writing on Cc and Tourism or Cc and Tourism Related Topics from 2018-2024 in AJHTL

The data revealed that the total number of relevant publications was 11(N=11) most of which were domiciled in three (3) countries, namely South Africa, Kenya, and Zimbabwe. Kenya and Zimbabwe each have one contributor, while South Africa has nine contributors. Kenya and Zimbabwe each contributed 9.1%, while South Africa contributes 82% (See Table 3).

S/No.	Topic(s)	Authors based countries
1	Bibliometric Analysis of Climate Change, Tourism, and Destination Marketing	South Africa
2	The Great O.R. Tambo International Airport Flood: Dealing with the Harsh Realities of Climate-induced Extreme Weather Events	South Africa
3	Climate Change Disclosures by Hotels in the Global South	South Africa
4	Nature-Based Tourism and Climate Change: The Risk Perceptions of Industry Stakeholders in the Waterberg, South Africa	South Africa
5	Climate change effects on natural resources availability and tourism sustainability in Maasai Mara National Game Reserve, Kenya	Kenya
6	The Business of Climate Change: A Perspective of Environmental Performance on the Tourism Industry	South Africa
7	Perspectives on Second Homes, Climate Change and Tourism in South Africa	South Africa
8	Sustainable Protection and Preservation of Heritage Sites Attractions from Climate Change in South Africa	South Africa

9	Proactive responses to mitigate Climate Change impacts by the hospitality sector in South Africa	South Africa
10	The Significance of Adaptation Interventions as a Tool to Protect the World Heritage Properties from the Negative Impacts of Climate Change	South Africa
11	Tourists' knowledge and perceptions on the impact of climate change on tourism in Okavango Delta, Botswana	South Africa
Source: Authors' compilation		

Table 3: Countries of Authors

Apart from Kenya, there is a concentration of research from a particular region of Africa- Southern Africa, signifying the value placed on "climate", "CC and tourism", and or "CC and tourism-related topics". Previous studies have also pointed at South Africa as the hub of climate and tourism due to its notable destinations (Victoria Falls, the Okavango Delta, Kruger National Park, & Cape Town) in the region. Although, there may be other reason(s) for this high value and regard for CC and tourism topics. This study assumes southern Africa has a high on climate, and tourism studies because of the role tourism plays a role in the economy of the region. Moreover, within southern Africa, South Africa is leading; this shows conscious or unconscious attempts to produce knowledge to guide the nation's tourism and CC discussions to mitigate the negative effect of CC on the tourism industry of South Africa. Scholars have previously pointed out South Africa's deliberate efforts and research towards tourism and CC to improve the adaptation of the tourism sector to CC. This suggests that there is a need for more awareness of CC and tourism, which should be supported by research funds in other countries in Africa [3,4,37].

Methods Used by Researchers in Tourism and Cc Studies

Research methods vary, and depending on what an author wants to study; 'there is no one research method and there is no research method that is superior to others. Meanwhile, the data revealed a high use of the documentary approach in all studies (see Figure 3) comprising the methods used, of which 78% used a secondary source-documentary approach. Note that, this is a deliberate attempt to isolate documentary analysis from a qualitative research method. Document analysis, 'has been an underused approach to qualitative research isolating it in this study will highlight its value and uniqueness; especially where studies are scarce on a particular topic, which helps to give direction(s) [38,39].

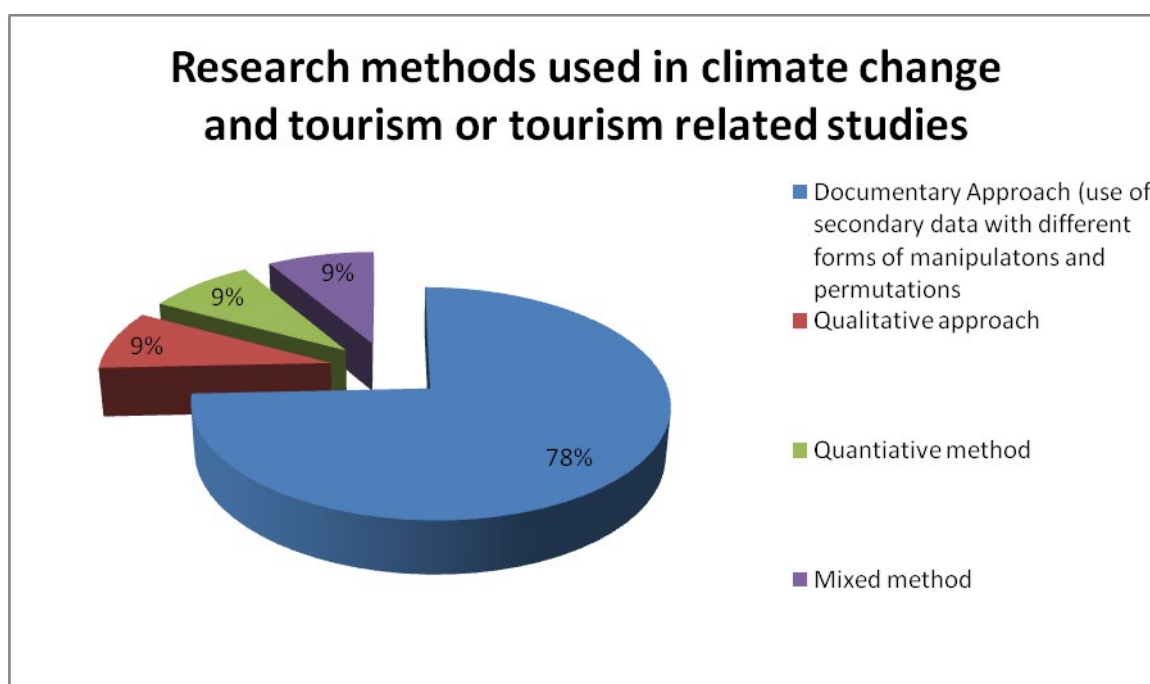


Figure 3: Shows Different Research Methods Used in Cc and Tourism/Tourism Related Studies And Vice Versa

Figure three (3) shows that the qualitative approach (including the documentary approach) dominates the approach used in CC and tourism studies in Africa. This result was not in agreement with a previous study where the result showed that tourism and CC studies used more quantitative research techniques [4]. The documentary method may have been predominant in Africa because, it is ideal to review the existing literature, which is easily available and inexpensive to source. Unlike quantitative methods, which require field data, it takes time and money. Money or funding for research within the scope of this study seems limited in Africa, unlike in Europe, which has a high number of publications, that use more of a quantitative approach. Conversely, it seems necessary to adopt a quantitative approach to measure actions and

inactions in CC and tourism studies, because, 'it describes, explains, analyzes and provides predictions on the observed phenomena or behavior, which will be useful in evaluating the impacts of CC on nature-based resources, especially in measuring variables and attributes of CC vis-à-vis tourism. Moreover, 'quantitative tourism research is usually employed to examine and understand tourism-related phenomena (e.g., the behavior of tourists, traveler characteristics, destination image assessment, perceptions, decision-making and destination selection, demand analysis, performance measures, and general market assessment and segmentation). It does so by collecting numerical and quantifiable primary (e.g., survey or longitudinal) and secondary (e.g., census and government sources, search engines, and organizations, or time-series data from agencies) data and analyzing those with statistical or computational methods and data analytics to describe, explain, and predict the phenomenon in question [41]. Conversely, the CT posits that 'the second main component (of CT) is the high sensitivity to initial conditions, that a minute change in the initial conditions, such as rounding errors in numerical computation of a certain dynamical system can produce cataclysmic and unpredictable outcomes for that dynamical system. Therefore, tourism scholars should use more methods that can easily identify what causes "a minute change" (any form of change in the atmospheric conditions) of tourism destinations in Africa. The identified factors or challenges that because CC can be reduced or removed to mitigate CC. Given this background, a perusal of Figure 2 shows the components of tourism, and Table 1 (1) comprises a list of topics within the scope of tourism and CC in Africa. Meanwhile, CO₂ is among the pollutants causing CC mainly through transportation, there is a need to take a detailed quantitative analysis of different means of transportation in Africa and how each contributes to CC, and such a study requires, a quantitative approach to help make informed decisions. This is why it appears more germane than qualitative study in CC and tourism studies [4,7,40,41].

The Implications of Cc and Tourism Research Within Africa

The data used in this study as seen in table one (1), shows the status of Africa within the context of literature on CC and tourism, and it shows that Africa is lagging, despite the abundant literature on tourism CC discussions globally. Previous studies suggest, that 'there is still a big challenge in developing countries, particularly, the African countries regarding marshaling political commitment and technical capacity on climate change and tourism policies. Therefore, there is a need for tourism research and studies linked to CC in Africa to churn out knowledge that can influence CC and tourism policy decisions. Such policies should position Africa among the top competing tourist destinations, as CC may affect Africa's attractiveness if not attended to on time. CT suggests that variations in the initial conditions of a place create chaos (e.g. CC). This implies that an increase in CO₂ contributes to the CC Conversely, tourism involves transportation, and transport-related CO₂ accounts for 5% of the world's emissions [4,29,42,43]. CT has shown that variation in 'initial conditions' can be affected, and tourism has the potential to cause variation in a destination's initial conditions (i.e., atmospheric conditions) such as Africa. This study advocates that, CC and tourism studies should be geared towards reducing CO₂ and other forms of environmental pollutions associated with tourism, which has the capacity to cause CC. This study supports and reinforces the earlier decisions of 'Agenda 2063: The Africa we want' of 2063 that contains seven (7) aspirations of which number one (1): Aspiration 1: A prosperous Africa based on inclusive growth and sustainable development. The subsections of aspiration one (1) read: "Africa's unique natural endowments, its environment and ecosystems, including its wildlife and wild lands are healthy, valued and protected, with climate resilient economies and communities...(16) Whilst Africa at present contributes less than 5% of global carbon emissions, it bears the brunt of the impact of climate change. Africa shall address the global challenges of the climate change by prioritizing adaptation in all our actions, drawing upon skills of diverse disciplines with adequate support (affordable technology development and transfer, capacity building, financial and technical resources) to ensure implementation of actions for the survival of the most vulnerable populations, including islands states, and for sustainable development and shared prosperity. (17) Africa will participate in global efforts for climate change mitigation that supports and broaden the policy space for sustainable development on the continent. Africa shall continue to speak with one voice and unity of purpose in advancing its position and interests on climate change. This study adds value to the discussion and aspirations of Agenda 2063 in preparing for CC, adapting and designing policies that will help in managing CC in the tourism sector, and how the tourism sector can contribute to reducing or mitigating CC. Importantly, CC cum tourism studies should be geared more and empirically towards curbing carbon emissions from the sector, especially from the transport unit and accommodation establishments that emit This has become relevant, since Chaos theory proposes that a small change in the initial status of a system can cause cataclysmic effect in the whole system. Therefore, the contributions of tourism value chains to the ecosystem creates negative impact (CO₂ emission), this should not be ignored.. Transportation is said to be 'by far the most important contributor to emissions, specifically road and air transport [1,44].

S/No.	Topic(s)	Research Method	Study objective(s)
1	Bibliometric Analysis of Climate Change, Tourism, and Destination Marketing	Documentary (Bibliometric analysis)	i) analyse which authors have published on climate change, tourism, and destination marketing (ii) analyse which years contain peer-reviewed documents related to climate change, tourism, and destination marketing (iii) analyse which documents were published per year by source (iv) analyse which documents were published by affiliation (v) analyse the number of documents published by country (vi) analyse which documents were published by type (vii) analyse documents published by subject area (viii) explore the connectedness of keywords climate change, tourism, and destination marketing for the published articles with other related themes on a VOSviewer network visualisation map (ix) analyse the citations of documents published (x) to provide recommendations on future studies.
2	The Great O.R. Tambo International Airport Flood: Dealing with the Harsh Realities of Climate-induced Extreme Weather Events	Documentary	(i) seeks to explore scientific documentation of the extent of the impact of this great OR Tambo International flood in terms of both the air and on-the-ground traffic, (ii) management interventions and other remedial measures to deal with such weather extremes & (iii) other remedial measures to deal with such weather extremes.
3	Climate Change Disclosures by Hotels in the Global South	Documentary	Aims to ascertain the practice of climate change disclosures by hotels in the Global South, particularly sub-Saharan Africa.
4	Nature-Based Tourism and Climate Change: The Risk Perceptions of Industry Stakeholders in the Waterberg, South Africa	Qualitative (interviews)	The objective of the research was to analyse the climate change perceptions of key tourism stakeholders in the Waterberg.
5	Climate change effects on natural resources availability and tourism sustainability in Massai Mara National Game Reserve, Kenya	Quantitative (Structured questionnaire)	The purpose of the study was to determine the effects of natural resources on tourism sustainability in Massai Mara National Game Reserve, Kenya.
6	The Business of Climate Change: A Perspective of Environmental Performance on the Tourism Industry	Documentary (Analysis of government climate change policies)	Attempts to analyse different preferences for corporate
7	Perspectives on Second Homes, Climate Change and Tourism in South Africa	Documentary (Integration of literature on both second home and climate change and tourism for South Africa).	The potential impact of climate change on second homes in a variety of localities in South Africa.
8	Sustainable Protection and Preservation of Heritage Sites Attractions from Climate Change in South Africa	Documentary (Non-empirical literature review)	The article examines potent interventions that have been introduced to curb these threats (i.e. climate change) to heritage sites.
9	Proactive responses to mitigate Climate Change impacts by the hospitality sector in South Africa	Documentary (Relevant literature on hospitality businesses and climate change)	The article showcases different ways in which the hospitality industry can reduce their negative impacts on the climate to climate changes.
10	The Significance of Adaptation Interventions as a Tool to Protect the World Heritage Properties from the Negative Impacts of Climate Change	Documentary (intensive and extensive use of literature on strategy on adaptation to climate change)	This article identifies a climate change adaptation strategy as the potential intervention that can be utilized to enable these sites (world heritage sites and properties) and properties to cope with the prevailing unusual climatic conditions in order to sustainably protect and preserve them for the present and future generations to enjoy.

11	Tourists' knowledge and perceptions on the impact of climate change on tourism in Okavango Delta, Botswana	Mixed method	(i) to examine tourists' perceptions and attitudes on climate change and the implications thereof on the Okavango Delta; (ii) to examine tourists' knowledge and awareness of how tourism impacts on climate change and (iii) to examine how the perceived impact of climate change will potentially affect travel patterns to the Okavango Delta UNESCO World Heritage Site.
Authors' compilation			

Table 4: Topics, Research Methods and Objectives Covered from 2018-2024

Table four (4) highlights the research methods and objectives of the sampled studies within the discussion of tourism and CC in Africa. And beyond the studies concentration in southern Africa, a lot needs to be done. There seems to be a need for a concerted and sincere effort among all tourism stakeholders in Africa if CC issue, impact, and future direction are to be addressed, as there are still poor or limited interdisciplinary and multi-stakeholder studies on CC and tourism discussion from Africa. Since tourism is multidimensional; the impact of CC cuts across all and sundry, multi-dimensional, and interdisciplinary researches are needed to control CC's impact on tourism and tourism's impact on CC for tourism sustainable development in emerging economies like Africa.

Conclusion

Africa's environment is a part of its tourism attractiveness which appears vulnerable to CC. Many African nations depend on tourism due to its economic and environmental benefits. Furthermore, unsustainable tourism activities and development can cause CC, which may affect which may affect African tourist destinations negatively. Creating instability that will cause chaos in the system such as CC, and this reinforces and supports Chaos theory. This supports the CT because a change (emissions from transportation, etc.) induces a change in the climate that invariably causes negative reactions in the system (i.e., the Earth's atmospheric condition) causing CC. Unfortunately, studies on climate, CC, and tourism in Africa are limited; the method used does not seem rigorous enough to direct policy decisions due to a lack of quantifiable empirical studies. Theories, methods, and approaches employed in these studies seem alien to Africa, but they offer a guide as to what is to be done. Positively, South Africa appears to have the highest number of studies in CC and tourism scholarship, and this probably has made South Africa appear in other publications within and outside the continent as a major hub for CC and tourism literature in Africa. Invariably, (tourism) destinations in South Africa appear to be the best Africa, if not in the world. Another implication of this study is that other countries in Africa may need to engage in discussions on CC and tourism; sponsor research to have ideas, knowledge, and substantive perspectives on the discussion. This will assist in producing CC and tourism policies in tandem with Africa's environmental realities. Because, it seems most developing nations are prone to CC vicissitudes due to the government's limited attention to tourism. It is worth noting that CC affects tourism and that the tourism value chain contributes to CC. African tourism stakeholders should start conceptualizing how to design substantive means of reducing tourism contributions to CC, while collaboration with geographers and other tourism related disciplines needed to study how best to handle the impacts of CC on African destinations. A major limitation of this study is reliance on one journal. Further studies need to explore more tourism journals indexed in Scopus and based in Africa [45-53].

Further Research Direction

Subsequent studies can use more journals. Second, tourism and CC studies concerning Africa should shift from documentary studies to empirical studies, assessing the impact of CC on different destinations, especially eco-based tourist attractions. C. There is a need for collaboration with authors residing in different regions of Africa, to see if results from one region could be useful to another; collaboration between African scholars and non-Africans on issue of CC and tourism should be explored.

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