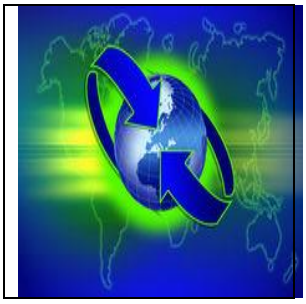

Effects of Some Weather Elements on Tourism and Recreational Activities in Anyigba, Kogi State

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Abstract

This study focused on the effects of some weather elements on tourism and recreational activities in Anyigba, Kogi State. The objectives of the study are to identify how some weather elements affect tourism and recreational activities in Anyigba, Kogi State, Nigeria and to suggest means of mitigating the effects of weather elements on tourism and recreational activities in the study area. The study used random sampling techniques to select sample of 385 respondents. The instrument for data collection is a structured questionnaire, which was administered to the selected sample of 385 respondents. Frequency distribution, percentages and Chi square were used to analyse the data. It was found that some weather elements affect outdoor recreation and tourism activities in the study area. These include precipitation, (rainfall) which affects outdoor tourist visitation activities (100%). Others include temperature (96.1%), high velocity of wind movement (95.3%) and relative humidity (86.0%) respectively. The study recommended that since precipitation (especially rainfall) affects outdoor tourist visitation activities, indoor recreational activities should be encouraged to reduce disruption of recreation and tourism activities during the rainy seasons. Proper drainage systems should be constructed to drain excess water from the epicentre of recreation activities during rainfall to avoid disruptions of recreation and tourism activities during raining season.
Keywords: Climate change, Weather Elements, Tourism activity, and Recreational facilities.

Introduction

Tourism has been variously defined by different authors the way they perceived it to be. Tourism involves the movement of people from their place of abode to a distance place away from their original home for the purpose of either catching fun, health or for other purposes. Tourism has different connotation, and different types. It could be tourism to watch games, to visit pristine natural habitat or other ecological resources like game reserve, biological gardens, forest reserves, natural forest landscape, national park or other natural artefacts located in their in-situ habitat. The tourism industry is one of the rapidly growing sectors of the global economy and many countries have productively increased their significance in the world through the

development of tourism business (United Nations World Tourism Organization [WTO, 2015]). As a developing economy, Nigeria is not left out of this global opportunity for economic diversification.

The Nigerian government views tourism as one of its important industries as it contributes up to 34% annually to the country's Gross Domestic Product (GDP) and 20% of the Nation's employment (National Bureau of Statistics [NBS], 2017). It is impossible to deny Nigeria its pride of place among the richly endowed potential tourist destinations in the world. It boasts of numerous tourist attractions, such as waterfalls, springs, hills, mountains, islands, excellent beaches, and a range of special and common species of tropical wildlife, diverse socio-cultural events, and heritage. This all important business and income generating activities is assumed to be impeded by some climate factors which characterises the area of study (Agbabiaka, 2016; Drawve, Kennedy & Caplan, 2020).

The hosting of a mega cultural festival offers an increase in employment, tourism, spending, and media coverage (Kim *et al*, 2006). For instance, temporary employment in Brazil has increased over time following the hosting of the biggest festival (Brazil-Carnival) in the world (Alessandro, 2016; Agbabiaka, 2016). Similarly, the annual Oktoberfest, Munich, allows Germany to constantly change any negative global views to those which distinguish it as hospitable and friendly (Harrington, Ottenbacher, von Freyberg, Paraskevas, & Schmidt, 2020). Additionally, the Knysna Oyster Festival in South Africa attracts thousands of visitors. An impact study conducted in 2016 shows that the festival made a significant contribution of 124million rand (the equivalent of USD7.6million) and the creation of about 2500 employment (Pick n Pay Knysna Oyster Festival, 2016). However, it is further cautioned that major cultural events have negative impacts on host destinations, including socio-cultural impacts such as crime (Agbabiaka, *et al.*, 2017). Although the attractions of the tourist destination are showcased in mega cultural events, some of the more negative features are also highlighted. Perceptions of

high crime rates and incidents of crime involving tourists are likely to tarnish the image of the host destination (Kim *et al*, 2006; World Meteorological Organization (WMO) 2017).

In Cross River State for example, the government of Cross River State had introduced the Calabar Christmas festival, a tourism venture which attracts both foreign and local tourists patronage to visit Calabar during the Christmas festival. The evnts include other side attractions like the Obudu mountain race, the boat regatta, carnival street party, beauty peageant competition, cultural dances, hotel services, food and cultural display among others. This events are usually held during the dry season to allow clean and clear weather to enable tourist have a full benefit of their time, money and objectives. Tourism sites include such places like the cross river national park, the agbokim waterfalls, the nkarasi famous monolith, the marina resort and towers, the oban spring among others (Zwiers, Zhang & Feng, 2011).

Almost every human activity, weather elements have one thing or the other to do with such activities. Tourism in Kogi state is principally influenced by rainfall, temperature, relative humidity, sunshine and cloud cover. Authors like Badiora, and Bako, (2020) observed that tourism is one major events that is weather or climate dependent. Some activities are carried out during the dry season like visiting coastlines and beaches for tourism purposes, while mountain top climbing is also better done during the drier season. This is because during the wet season, the risks involved in visitation to coastlines and beaches are also to mountain tops are too high to take. While visitation to forest for ecotourism activities can be done both during rainy and dry season, there are some aspects of the visitation that also risky during the wrong season and time (Gümüş, Soydan, Şimşek, Algin, Aköz & Yenigun, 2017).

Globally, climate change is expected to affect a wide range of activities and have implications on economic growth, productivity, ecosystems, and sustainable development (IPCC, 2021). In the pre-COVID-19 era, travel and tourism constituted one of the world's largest sectors. In 2019, this

sector accounted for 10.4% of the global GDP (USD 9.2 trillion) and 10.6% of all jobs (334 million), and was responsible for creating one out of four new jobs across the world. Moreover, in 2019, international visitors' spending amounted to about USD 1.7 trillion, making it the third largest export earnings (6.8% of total exports, 27.4% of global services exports) (Chan & Wichman, 2020). Even though COVID-19-related restrictions caused a significant decline in activities in this sector, recovery is expected around 2024. Moreover, domestic and regional vacations outdoors are already on the rise (World Travel & Tourism Council [WTTC], 2021).

Climate is an important factor in destination choice and the trip preparation process. Good weather triggers the arrival of more visitors. Many tourist destinations are seasonal, but they present daily variability in tourist flow, even within the peak season due to institutional factors such as work requirements (public holidays or workday) or school holidays. Other natural factors include climatic characteristics (air, temperature or rainfall), these factors decisively influence the variability of the daily flow of tourists (Scott & Lemieux, 2015). On the other hand, how tourists respond to the weather conditions they encounter and their behavioural responses to weather variability and the consequent changes in tourism demand constitute a field that is still developing and not sufficiently understood (Tofu & Mengistu, 2023).

Several studies on the impacts of weather elements on tourism has been conducted. Teitler and Palatnik, (2022) conducted a study titled: Implications of climate change on outdoor recreation: The case of national parks in Israel; using a unique database of actual daily visits by international and domestic tourists to national parks in Israel during a six-year period (2012–2017). Each national park has different accessibility characteristics and offers different attractions. The climate data included daily maximum temperature, rainfall, extreme weather, as well as temperature indices measuring heat and cold. The results of the econometric analysis showed that weather-related parameters have a statistically significant effects on national park visits among

both domestic and international tourists, while the magnitude of the effect varies by park and visitors' place of origin.

Caldeira and Kastenholz, (2018) did a study on predicting climate change effects on urban tourists' time–space experience using data collected via GPS technology and a post-visit survey of tourists (n = 404), tourists visiting Lisbon during the summer were analysed via structural equation modelling (PLS-SEM). The results report empirical evidence of the present impact of (summer) weather on urban tourists' time–space activity and on their intra-destination experience evaluation. Specifically, maximum air temperature was found to have a significant negative effect on overall satisfaction, while the meteorological conditions of the entire day reveals a significant impact on tourists' activities and movements. The results are particularly useful for the sustainable adaptive management of urban attractions and destinations that are especially vulnerable to climate change, as well as in managing its adverse impact on tourists' experiences.

Isabel, Liliane, Alcântara and Cioce, (2018) conducted a study on tourism under climate change scenarios: impacts, possibilities, and challenges using a descriptive/analytical, interdisciplinary, and systemic approach, using bibliometric and documentary research, and interviews with tourism development and climate change experts. The results include the construction of scenarios that may show the possible impacts and consequences of climate change on the international tourism system, providing information for mitigation purposes, planning for adaptation actions, and minimizing impacts and vulnerability. Most researchers have done several works on climate and tourism but none of them seems to cover the effects of weather elements on tourism. To fill this gap, this study seeks to assess the effect of some weather elements on tourism and recreational activities in Anyigba, Dekina Local Government area of Kogi State.

Materials and methods

study Area

Anyigba is a town in Dekina Local Government Area of Kogi State, Nigeria. The town is located at the south eastern direction of Lokoja, about 100km from Kogi State Capital in North Central Nigeria. The study area which is geographically defined by latitude $7^0$28'N and $7^0$32'S of the equator and longitude $7^0$9'E and $7^0$12'W of the Greenwich meridian, with an aerial extent of about 31.8 kilometre square and an average elevation of 354 meters above sea level (Tokula & Adekiya, 2018). Anyigba is underlain by sedimentary rocks of upper Cretaceous Age which is mainly made up of shale, sandstone, sand and clay. The whole region consists of deeply weathered regolith which accounts for the great depth of water table (aquifer) which in most cases approaches 204 - 300m (Iji, 2007) in Ogunkolu, Eneche, Ogbole, Oyetunji and Shaibu, (2019).

Anyigba is located within the tropical area, thus the climate is governed by the processes that controls the tropical climate. However, it can be described as tropical wet and dry (Aw) climate using the Koppen's classification system (Ogunkolu, et al., 2019). Temperature is therefore very high, the mean monthly temperature ranges between 21^0C and 32^0C. The daily range in temperature is about 6^0C and the annual variation is about 3^0C in some years. The highest temperature occurs just before the rainy season begins (Abike & Olusegun, 2015). The vegetation of the study area is predominantly Guinea Savannah type which is characterized by discontinuous canopy, shrubs and tall grasses giving the area a park appearance. The wooded savannah trees found in the area include economic trees such as locust bean (*Parkia biglobosa*), shear butter trees (*Vitellaria paradoxa*), mahogany (*Swietenia macrophylla*) and obeche (*Triplochiton scleroxylon*) required for timber production (Tokula & Adekiya, 2018).

Anyigba has a gently undulating landscape to a flat and minimum rugged landform surface with an average elevation of 380m above sea-level. The relief is also composed of rounded to flat top hills that were seen as femiginised sandstone. The upper and lower coal measures are subjected to gully erosion. Anyigba is laid out on a gently undulating land between 270 and 390 metres

above sea (Abike & Awosusi, 2015). The drainage of the area is not very complex. Among the few rivers that are found in the area are Ogane-aji River in the Northern part of the town and Abu-uja Lake at Ojofu covering an area of about 400m^2 (Ogunkolu, et al., 2019). Other rivers around Anyigba area are Imabolo River, Ofu River and Okura River, they are mostly perennial but with a reduction in volume during the dry season (Ogunkolu, et al., 2019).

The population of the area is approximately 71,323 (NPC, 2006) and projected to be 110,675 in 2023 using 2.63% annual growth rate. The rapid population growth is due to natural increase and immigration, resulting from the establishment of the Kogi state University with an estimated population of over 22,000 both staff and students. This makes about 20% of the total population of the area.

Trading is a major viable socio-economic activity of the people. They buy food items such as palm oil, beans, yam, rice and millet; clothing materials among others are sold in the market. The majority of rural dwellers in the area are engaged in peasant farming and other agricultural activities. There are other socio-economic activities such as weaving, barbing, petty trading, banking and others contributing to the development of the area. Cashew (*Anacade occidentalis*) farming is also another major socio-economic activity in the area, as cashew farmers buy large expanse of land, plant various species of cashew, harvest them and sell in due season.

Figure 1: Nigeria showing Kogi State
Source: Department of Geography and Environmental Studies, PAAU, Anyigba (2020)

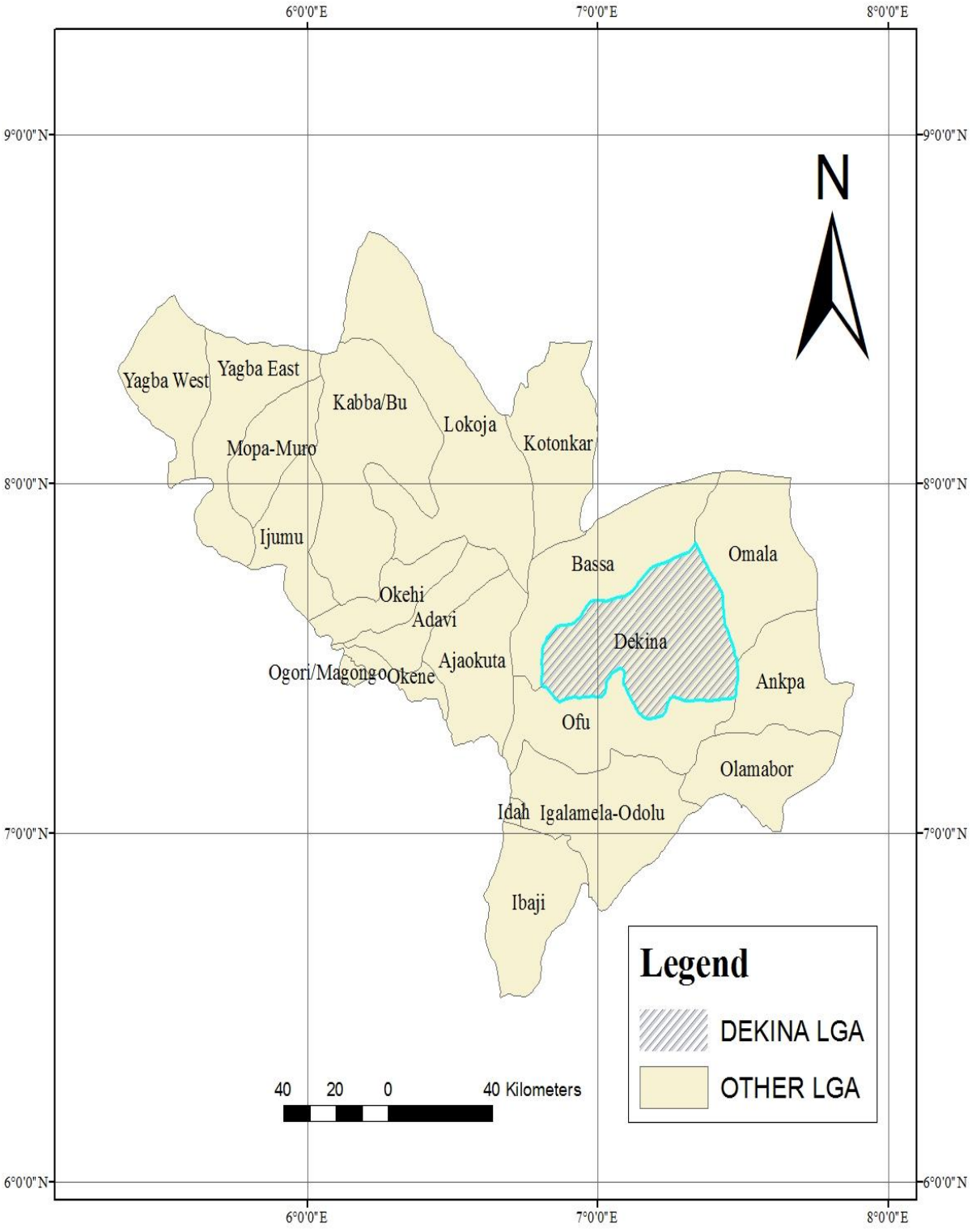

Figure 2: Kogi state showing Dekina LGA
Source: Department of Geography and Environmental Studies, PAAU, Ayingba (2020).

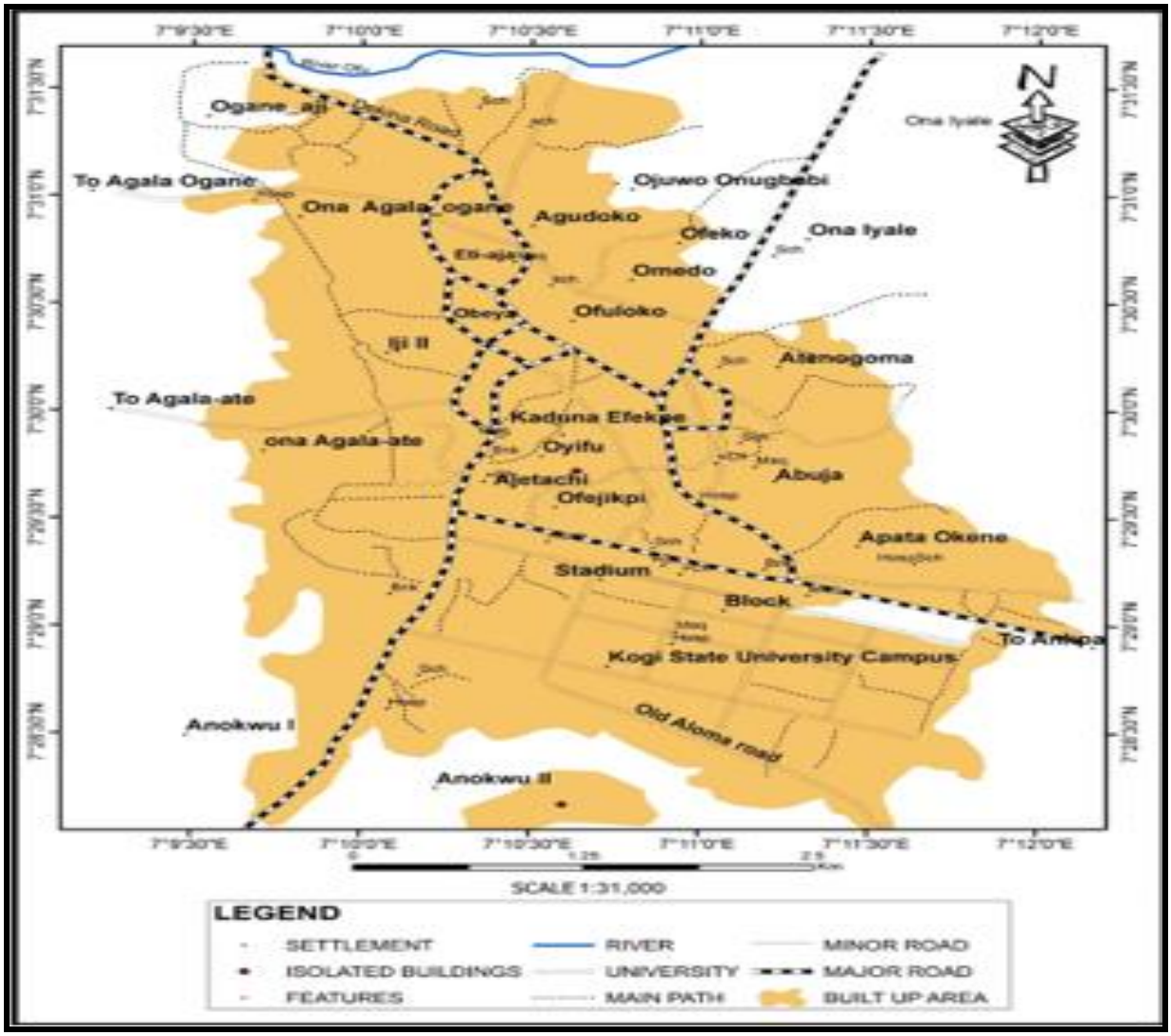

Figure 3: Anyigba showing Study Area
Source: Department of Geography and Environmental Studies, PAAU, Ayingba (2020)

There are various land uses in Anyigba which ranges from educational land use (Kogi State University, Secondary and primary schools), commercial land use (banks, shopping complex/plaza, markets), Industrial land use (Sachet water factories, bakeries, garri/Akpu processing), Agricultural land use (Cashew plantation, palm tree plantation, cassava farms), cultural land use (sacred places of traditional worships), etc.

Descriptive survey design was adopted for this study because the study assessed the effect of weather elements on tourism and recreational activities in Anyigba, Dekina Local Government Area, Kogi State. A reconnaissance survey was carried out by the researchers in other to gain the first-hand knowledge of Anyigba. The study used both primary and secondary data. A total of

four hundred (400) questionnaires were administered for the purpose of this study. However, a total of 385 were returned for analysis.

The simple random sampling technique was used to select sample from the population in the study area. Quantitative data obtained through the questionnaires were subjected to both descriptive and inferential statistics. The descriptive analysis that were used includes frequency count, percentages and mean. The 4-point Likert scale was used for scoring responses like strongly agree, agree, disagree, and strongly disagreed and 4-point likert scale with acceptance benchmark of 2.5, while the inferential statistics was chi-square statistics to test the relationship between weather variability and tourism/recreational activities in Anyigba, Dekina Local Government Area of Kogi State

Result and Discussion

The location of potential tourism and recreational centers is critical in assessing the impact of weather elements.

Table 1: Coordinates of Tourism and Recreational Centers in Anyigba

Labels	Names of places	X	Y
S 01	Anyigba hotel	7.184961	7.490008
S 02	KSU sport arena	7.180226	7.488619
S 03	Wisdom home hotel	7.175712	7.490527
S 04	Oyibe hotel	7.167787	7.476619
S 05	Ofu waterfall	7.150751	7.529239
S 06	Orbital hotel	7.193894	7.486096
S 07	Harbour bay hotel	7.201309	7.485037
S 08	Ojuwo-Onugbabi	7.183061	7.517196
S 09	River Ofu Dam	7.162307	7.529239

Source: GIS Laboratory, PAAU, Anyigba, (2022).

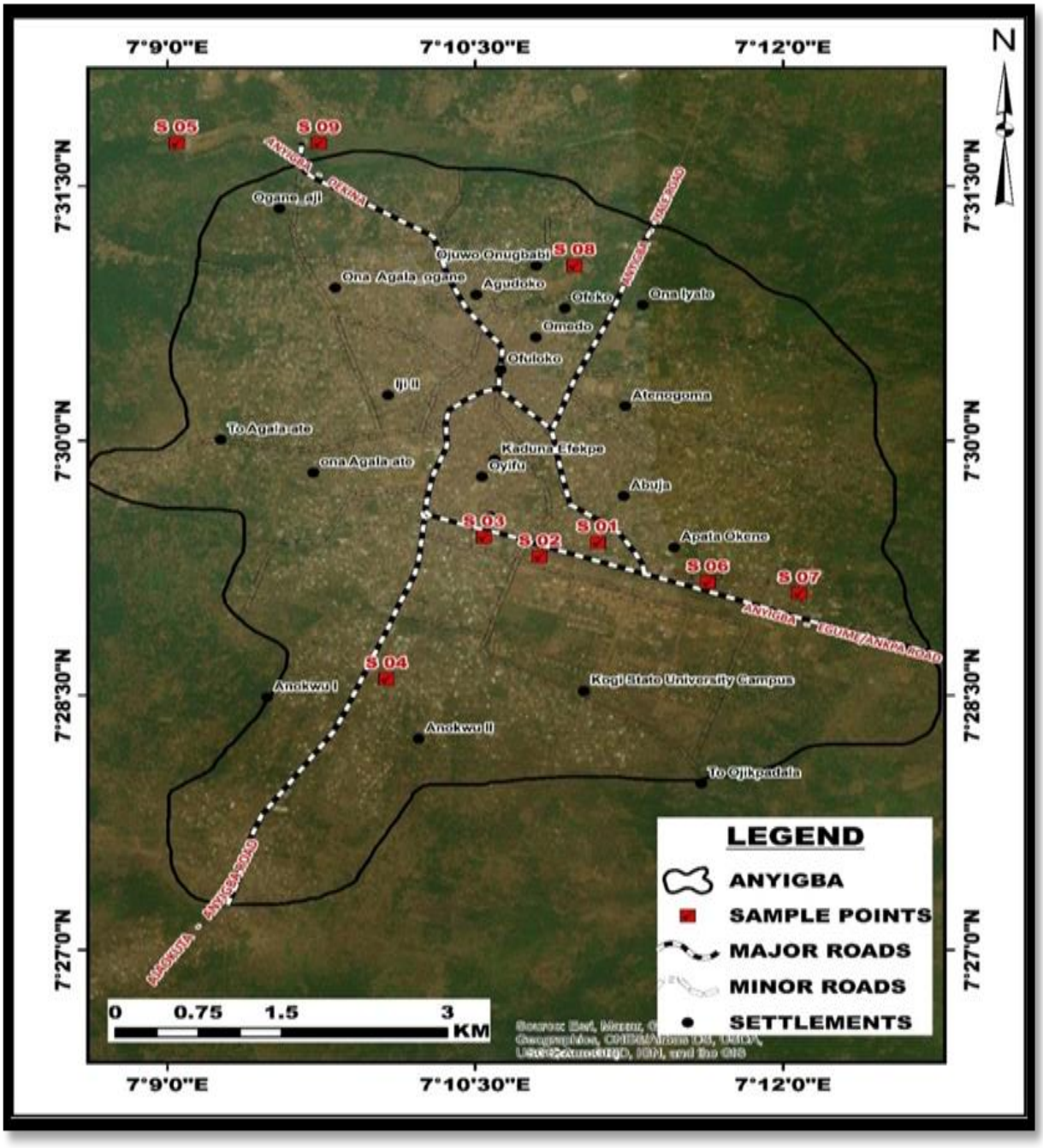

Figure 3: Tourism and Recreational Centres in Anyigba, Kogi State.
Source: *GIS Laboratory, PAAU, Anyigba, (2022).*

Figure 3 shows the tourist centres in Anyigba which include Anyigba Hotel, KSU Sport Arena, Wisdom Home Hotel, Oyibe Hotel, Ofu Waterfall, Orbital Hotel, Harbour Bay Hotel, Ojuwo Onugbabi, and River Ofu. These places are all located in Anyigba and they serve as tourism and recreation centres in the area.

Table2: Weather element that affects outdoor tourism visitation activities

S/ No	Item	SA (4)	A (3)	D (2)	SD (1)	Mean	Decision
1.	Precipitation, especially rainfall affects outdoor tourist visitation activities	294 **(**76.4**%)**	91 **(**23.6**%)**	0 **(**0**%)**	0 **(**0**%)**	**3.2**	**Accepted**
2.	Temperature affects outdoor tourist visitation activities	271 **(**70.4**%)**	99 **(**25.7**%)**	6 **(**1.6**%)**	9 **(**2.3**%)**	**3.5**	**Accepted**
3.	Relative humidity affects outdoor tourism visitation activities	271 **(**70.4**%)**	60 **(**15.6**%)**	24 **(**6.2**%)**	30 **(**7.8**%)**	**3.6**	**Accepted**
4.	High velocity of wind movement outdoor tourist visitation activities	280 **(**72.7**%)**	87 **(**22.6**%)**	6 **(**1.6**%)**	12 **(**3.1**%)**	**3.6**	**Accepted**
5.	Cloud cover affects outdoor tourist activities	186 **(**48.3**%)**	178 **(**46.2**%)**	15 **(**3.9**%)**	6 **(**1.6**%)**	**3.2**	**Accepted**

Source: Field Work, 2022.
Keys: *SA= Strongly Agree; A= Agree; D= Disagree; SD= Strongly Disagree*

From table 2, based on the calculated mean, it was revealed that the weather element that affects outdoor tourism visitation activities are: Precipitation, especially rainfall affecting outdoor tourist visitation activities, Temperature affects outdoor tourist visitation activities, High velocity of wind movement also affects outdoor tourist visitation activities during outdoor tourist

activities, and cloud cover affects outdoor tourist activities. This was indicated by majority of the respondents as their mean response was above the acceptable benchmark of 4-point likert scale of 2.5, hence, the acceptance benchmark was gotten by adding (SA)4+ (A)3+ (D)2+ (SD)1 = 10/4 = 2.5. Therefore, they were accepted. The implication of this finding is that almost all weather elements affects tourism and recreational activities from time to time.

However, unlike the temperate region of the world where it had been widely reported that fog do not affected outdoor recreation activities, in this study it has no effect on outdoor tourism activities in that study area located in the tropical climate. Particularly, item (5) on table 2 revealed that majority of the respondents indicated that fog do not obscure their sight during outdoor tourism. This finding is supported by Scott and Lemieux, (2015) who found that many tourist destinations are seasonal, but they present daily variability in tourist flow even within the peak season due to institutional factors such as work requirements (public holidays or workday) or school holidays. Other natural factors include climatic characteristics (hours of air temperature or rainfall), decisively influence the variability of the daily flow of tourists

Furthermore, table 2 reveals that majority of the respondents 100% agree that Precipitation, especially rainfall affects outdoor tourist visitation activities, followed by 96.1% Temperature affects outdoor tourist visitation activities, 95.3% High velocity of wind movement and cloud cover affects outdoor tourist activities. This is expected as little change in the weather elements affects movement of people from one place to another.

Table 3 shows the extent of the effects of weather elements on recreational activities/tourists attraction sites in the study area as the findings show that, Hot weather discourages tourists from visiting recreation centres and tourists attraction sites, excessive rainfall discourages tourists from visiting natural attractions, Short duration of sunshine discourages outdoor tourists activities,

heavy wind has reduced outdoor tourist activities, and high humidity affects tourists from going out for tourist visitation.

Table 3: Extent of the effects of weather elements on recreational activities / tourists attraction sites in the study area.

S/ No	Statement	SA (4)	A (3)	D (2)	SD (1)	Mean	Decision
1.	Hot weather discourages from visiting recreation centers Tourists attraction sites	253 (65.7%)	60 (15.6%)	33 (8.6%)	39 (10.1%)	3.6	Accepted
2.	Excessive rainfall discourages tourists from visiting natural attractions	221 (57.4%)	143 (37.1%)	12 (3.1%)	9 (2.3%)	3.5	Accepted
3.	Short duration of sunshine make discourages outdoor tourists activities	208 (54.0%)	138 (35.8%)	27 (7.0%)	12 (3.1%)	3.6	Accepted
4.	Heavy Wind has reduced outdoor tourist activities	265 (68.8%)	108 (28.1%)	6 (1.6%)	6 (1.6%)	3.6	Accepted
5.	High humidity affects tourists from going out for tourist visitation	220 (57.1%)	111 (28.8%)	36 (9.4%)	18 (4.7%)	3.0	Accepted

Source: Field Work, 2022.
Keys: *SA= Strongly Agree; A= Agree; D= Disagree; SD= Strongly Disagree*

This was indicated by majority of the respondents as their mean response was above the acceptance benchmark of 4-point likert scale of 2.5. Therefore, it was accepted. The implication

of this is that, human activities are interrupted due to little change in their physical environment and conditions.

However, majority of the respondents 96.9% agree that heavy wind has reduced outdoor tourist activities. It is followed by 94.5% excessive rainfall discourages tourists from visiting natural attractions by replacing waterfronts with swimming pools, 89.8% Short duration of sunshine discourages outdoor tourists activities, 85.9% High humidity affects tourists from going out for tourism visitation and 81.3% Hot weather discourages from visiting recreation centres and tourists' attraction sites. This is expected as weather extremes in the study area mostly inform how people carry out tourism and recreational activities. This corroborate with the findings of Hamilton et al., (2019) which asserted that weather elements affects tourist performance.

Table 4: Possible measures aimed at mitigating the effects of weather elements on tourism and recreational activities.

S/No	Statement	SA (4)	A (3)	D (2)	SD (1)	Mean	Decision
1.	Use of clean energy i.e. environmental-friendly energy	211 **(54.8%)**	108 **(28.1%)**	33 **(8.6%)**	33 **(8.6%)**	**3.6**	**Accepted**
2.	Enactment and enforcement of legislation to encourage the conservation of natural ecosystems	266 **(69.1%)**	98 **(25.5%)**	12 **(3.1%)**	9 **(2.3%)**	**3.5**	**Accepted**
3.	Creation of awareness on importance of tourisms to individuals and society	242 **(62.9%)**	71 **(18.4%)**	33 **(8.6%)**	39 **(10.1%)**	**3.6**	**Accepted** **81.3**
4.	Regulation of agricultural practices that may affect tourism and recreation	192 **(49.9%)**	153 **(39.7%)**	27 **(7.0%)**	13 **(3.4%)**	**3.6**	**Accepted**
5.	Control of waste disposal techniques affecting the weather condition	202 **(52.5%)**	129 **(33.5%)**	36 **(9.4%)**	18 **(4.7%)**	**3.0**	**Accepted**

Source: Field Work, 2022.
Keys: SA= Strongly Agree; A= Agree; D= Disagree; SD= Strongly Disagree

Table 4 shows the possible measures aimed at mitigating the effects of weather elements on tourism and recreational activities. The findings show that, use of clean energy i.e.

environmental-friendly energy, Enactment and enforcement of legislation to encourage the conservation of natural ecosystems, Creation of awareness on importance of tourisms to individuals and society, Regulation of agricultural practices that may affect tourism and recreation, and Control of waste disposal techniques affecting the weather condition. This was indicated by majority of the respondents as their mean response was above the acceptance benchmark of 4-point likert scale of 2.5, therefore, it was accepted. The implication of this finding is that measures can be put in place by relevant stakeholders to mitigate the effects of weather elements on tourism and recreational activities.

Therefore, table 4 indicates that the majority of the respondents 94.6% agree that Enactment and enforcement of legislation to encourage the conservation of natural ecosystems. This is followed by 89.6% Regulation of agricultural practices that may affect tourism and recreation, 86% Control of waste disposal techniques affecting the weather condition, 82.9% Use of clean energy i.e. environmental-friendly energy and 81.3% Creation of awareness on importance of tourisms to individuals and society. This is expected as weather elements can be controlled directly or indirectly by policies and practices in the environment. This is in line with Hewer and Gough, (2016) whose finding show that, a better understanding of daily demand flows can moderate economic damages by entailing a downward alteration of these forecasts due to change in weather. Hence, there can be regulations of change in weather element as they have impact on destination choice and tourist flows, with a gradual shift towards more suitable locations.

Test of Hypothesis: H_0: There is no significant relationship between change in rainfall, sunshine and tourism/recreation activities in Anyigba, Dekina Local Government Area of Kogi State.

Table 5: Chi square analysis of no significant relationship between rainfall, sunshine, relative humidity and tourism/ recreation activities in Dekina LGA of Kogi, Nigeria

	Value	Df	Aspmp.sig.(2-sided)
Chi-Square	115.407[a]	9	.000

Likelihood Ratio	81.718	9	.000
Linear-by-Linear Association	27.456	1	.000
N of Valid Cases	385		

a. 7 cells (43.8%) have expected count less than 5. The minimum expected count is .37.

The rule is that; if the calculated value of X^2 is greater than the P-value, accept the H_i: (Alternate hypothesis) and reject the H_0: (Null hypothesis). The computed value of X^2 is equal to 115.407 which is greater than the p-value at 0.05 level of significance. Therefore, we do not reject H_0, which says "There is significant relationship between rainfall, sunshine and tourism/recreation activities in Anyigba, Dekina Local Government, Kogi state.

Discussion of findings

From the result of the simple percentage analysis on table 1, 2 and 3, some weather elements affects tourism and recreational activities in the study area. This is a confirmation of the earlier finding of Caldeira and Kastenholz, (2018), who forecasted the effects of climate change on urban tourist's time space experience using GIS data technology collection system. These authors found that climate change has had very serious effects on urban tourism because when climate elements like rainfall and precipitation occurs, tourists' time are spent indoors where they are confined to wait for the rain to stop before they can proceed with their tourism activities (see also tables 3, 4 and 5). Most often, when rainfalls, the environment if not developed but left in its natural state will become difficult, especially in muddy or swampy area like Lokoja, Anyigba and Calabar, Cross River state, where rainfall has very high intensity and frequencies due to the tropical rainforest and the continental effects of the sea and rivers around the state.

The Chi square analysis on table 5 also indicated that the weather events or elements listed above have direct bearing on tourism and recreation activities in the study area, implying that there is a significant influence of these weather elements on tourism and recreation activities in the study area. This result also is similar to those of Agbabiaka, (2016); Alessandro, (2016); Badiora and Bako, (2020) who in their respective studies found significant influence of climate elements like temperature, rainfall, relative humidity and sunshine on tourism and recreation activities. These authors found that extreme weather events are detrimental to tourism and recreation activities. These authors further reported how during rainstorms, some medical students who were tourists were drowned in the Calabar river when they were catching fun in a Cruise boat in Calabar just recently. These was because the rainfall was accompanied by the overflow of water from the seas into the Calabar river, which is tributary that feed or empties its water into the Atlantic Ocean.

Authors like Giddy, et al., (2017); Chan and Wichman, (2020); Drawve, et al., (2020) had earlier found a significant relationship between climate change, tourism and income generation through tourism related sale and services. These authors concluded that climate change has significant influence on tourism ventures ranging from facilities, transportation catering services, tour guide, accommodation provision, safari sales, and other social vices like robbery, stealing, rape, terrorism among others. When most persons cannot fend for themselves when tourism related activities they perform are no longer tenable, especially during the off peak periods, or epidemic outbreak, most persons' loss their sources of income (livelihoods) because tourists hardly travel during these off peak periods. Income would be loss, even some organized tourism related outfit usually lay off some of their staff because they will not have the needed resources to carter for these non-essential staff.

In these situation, some of the staff may become tempted to steal from tourist to make ends meet. In some cases, tourists are afraid for their lives, they would consider not taking the risks of travelling to other places because of a ravaging epidemic, terrorist activities, civil unrest or

natural or manmade disasters. In these situation, global climate change influence tourism and recreation activities patterns. Furthermore, this result also confirmed the results of Harrington, et al. (2020) whose work on interpreting the relationships among Oktoberfest tourists' experiences and perceived value, overall satisfaction and loyalty behaviours for better marketing strategy decisions. The authors found that when weather elements influence tourism and recreation seekers activities, they develop negative attitude towards revisiting that tourism or recreation site in the future. They either choose not to come there again, or try to understand the seasonal climate calendars to enable them plan properly for future engagements. When situations like this occurs, tourists would have a bitter experience about that location. To the marketers of such tourism sites and infrastructure, it will become almost a herculean task for them to be able to market such ventures since tourist are already complaining about their gory experiences during the extreme weather events visitation to the site (Ogunkolu, et al., 2019; Tofu. & Mengistu, 2023).

Despite this result, this work is a refutation of the works of authors like Schoofa and Robesonb, (2016); Isabel, et al., (2018) whose work found no significant relationship between weather events and tourism activities. These works though, did not find any significant relationship between extreme temperature, precipitation, cloud cover, rainfall, sunshine and continental effects on recreation activities, but they accepted the fact that these weather elements influence outdoor tourism or recreation activities in some ways.

From this discussion, it is necessary to state that there is a significant influence of weather elements on tourism and recreation activities in the study area. This work has confirmed the works of a lot of scholars whose works were reviewed in this present study. Despite the few dissenting works, all other works points to the fact that temperature, relative humidity, precipitation, rainfalls, sunshine and other weather elements have significant influence on outdoor tourism and recreation activities in Kogi state, Nigeria.

Conclusions and Recommendations

Tourism potentials of a particular place improve the socio-economic activities of such areas. However, the extent of the impact of weather elements to the accessibility of this tourism sites is of great importance. Anyigba remains one of the tourism destinations given the availability of potential tourism sites. Therefore, all stakeholders in the tourism sector should put in place the right frame work that will mitigate the negative effect of weather elements in order to sustain robust tourism activities in Anyigba.

Therefore, the following recommendations were made based on the major findings of this study:

1. Since precipitation, especially rainfall affects outdoor tourist visitation activities; it is recommended that proper drainage systems be built by the state and local government to drain excess water during rainfall.
2. The extent of the effects of weather elements on recreational activities/tourists attraction include hot weather discouraging visitation of recreational centres, hence, it is recommended that management of recreational centres should equip their destinations with air-conditioners and proper ventilation
3. The possible measure aimed at mitigating the effects of weather elements on tourism and recreational activities include the use of clean energy, hence, it is recommended that solar energy should be used to replace conventional use of diesel powered generators in recreational centres.

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