

**Assessing The Economic Fallout Of Climate Change In Nigeria With Special Edge Of
Tourism Industry: Challenges And Policy Implementations**

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Abstract

The purpose of this article is to examine the impact of climate change on the Nigerian economy, particularly the tourism industry. The study found that global warming and climate change have increased significantly over the past two decades. Over 830 kilometers of Nigerian coastline are under threat from flooding, erosion, water and climate. Communities in the Niger Delta state on the Atlantic coast have lost or fear losing their homes and lands due to rocks crashing into their beaches. Forests have been destroyed due to desertification. The frequency of natural disasters in the country is linked to climate change. As a result, increased demand for food has led to widespread conflict. Coastal areas such as Delta, Bayelsa, Anambra, Lagos and Kogi are most at risk from the effects of climate change. Heatwaves, droughts, inland floods, wildfires and coastal flooding are the biggest impacts of climate change. The effects of climate change can cost homeowners thousands of Naira. The tourism industry is very sensitive to the effects of climate change. The weather is vital for tourists. Climate change will cause changes in biodiversity, which will affect ecotourism. Rising temperatures shorten the sports season, shortening the life of the resort. The role of tourism industry in economy of Nigeria is not significant. Therefore, Federal Government and State Governments need to implement policies to reduce the financial impacts of climate change.

Keywords: Climate change, Global warming, Flood, Famine, and Tourism industry.

Introduction

Africa is vulnerable to the effects of global warming. The average temperature in Africa has increased by 1.4 degrees Celsius since the pre-industrial era. As a result, Africa is warming faster than the rest of the world. Nigeria is not immune to the effects of climate change compared to the rest of the world. The effects of climate change are felt in Nigeria's agricultural regions (Chukwuma, 2014). The Nigerian economy is a middle-income, mixed and developing economy with extensive manufacturing, finance, services, communications, technology and entertainment businesses. The Nigerian economy is suffering from an ongoing economic crisis in the energy sector. It has large reserves of coal, oil and natural gas. It is Africa's largest oil producer; residents often face problems with electricity usage (Ogbuabor & Egwuchukwu,

2017). Nigeria's economy is a major source of activity because the country is diverse but also includes forests, savannas, waterfalls and other tourist attractions. A major source of Nigeria's foreign exchange earnings is remittances sent home by Nigerians abroad. Nigeria was once food grains exporter but now imports food grains (Hambira & Saarinen, 2015).

According 2024 estimates, gross domestic product (PPP) of Nigeria is \$1.443 trillion USD. The nominal gross domestic product is \$252.738 billion USD. Nigeria's economic potential is constrained by number of structural problems, including infrastructure deficiencies, tariff and non-tariff trade barriers, trade barriers, lack of confidence in the currency and limited ability to exchange foreign currency. Climate change has emerged at an alarming rate, and the government has now said it will work hard to combat its effects (Olaniyi et. al., 2013). Despite abundant oil and gas resources, Nigeria is experiencing electricity shortages, with many people relying on gas and electric heaters to cool their homes. The heat is also expected to reduce agricultural production, a sector that accounts for about 22 percent of Nigeria's gross domestic product and more than a third of its total business.

Objectives of the Study:

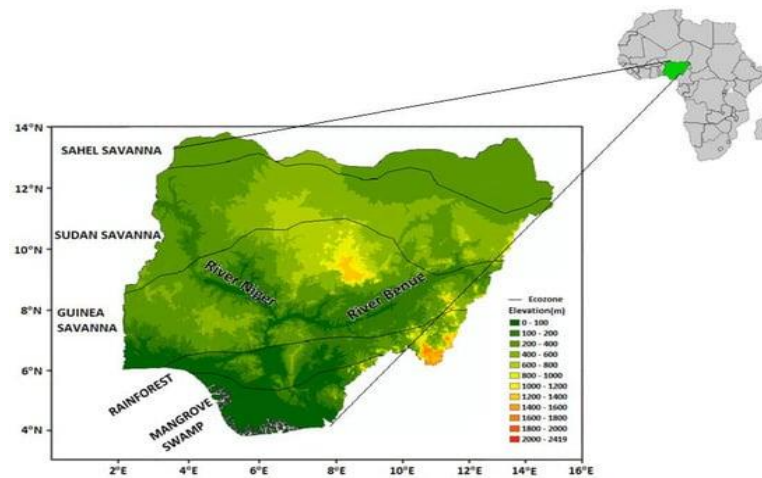
The objectives of the study were:

- (a) To study the impacts and vulnerabilities of climate change on economy of Nigeria.
- (b) To observe the impact of climate change on sustainability of tourism industry of Nigeria.
- (c) To study the Government plans and policies for mitigating the Climate change effects.

Methods and Materials

Study area: Nigeria is a country in West Africa. It is located between the Sahel region of the Atlantic Ocean to the north and the Gulf of Guinea to the south. It covers an area of 923,769 square kilometers. It is the most populous country in Africa. Nigeria borders Niger, Chad, Cameroon and Benin. Nigeria is a federal country consisting of 36 states and the Federal Capital Territory, with Abuja as its capital. Nigeria is a diverse country with over 250 ethnic groups speaking 500 different languages. It is broadly divided between Muslims, who live mostly in the north of the country, and Christians, who live mostly in the south of the country. Nigeria is a regional power in Africa and a middle power in international relations. It is often referred to as the Giant of Africa due to its large population and developed economy and is considered an emerging market by the World Bank. Abuja is the capital and Lagos is the largest

city. English is the official language. Yoruba, Igbo and Hausa are the National languages. Naira is the currency of Nigeria.



Hypothesis:

H₀₁: There are no impact of corona pandemic on tourism industry in Nigeria.

H_{1a}: There are impact of corona pandemic on the tourism industry in Nigeria.

H₀₂: There are no relationship between tourist arrivals and its contribution in gross domestic product of Nigeria.

H_{1b}: There are relationship between tourist arrivals and its contribution in gross domestic product of Nigeria.

Design and approach: The design of this study was defined and used as qualitative and quantitative data. Secondary data was used in this research. Secondary data is collected by various governments. reports, Nigeria Tourism Department, international publications, research articles, published articles, online papers etc.

Method of analysis: A range of qualitative and quantitative analysis methods, including descriptive, analytical content, textual and regression analysis, were used to uncover the full spectrum of approaches to climate change and its impact on tourism industry in specific. Simple repression model is used in the study, where number of tourist arrivals is the independent variable and its revenue share in gross state domestic product is the dependent variable.

Results and Discussion

Nigeria is Africa's largest economy and most populous country, and is rich in natural resources, particularly oil and natural gas. Its diverse ecoregions have given rise to a variety of livelihoods, agriculture, and crops, all of which are affected by climate change. Rising sea levels threaten southern cities and coastal areas like Lagos, making them vulnerable to flooding and waterborne diseases (Wongtada, 2017). Drought and low rainfall, combined with high temperatures, have impacted the country's energy efficiency, disrupted agriculture and

fisheries, reduced food security, and deteriorated health and nutrition. The largest contributors to greenhouse gas emissions are the energy sector, deforestation, and land conversion (Pandy & Rogerson, 2021).

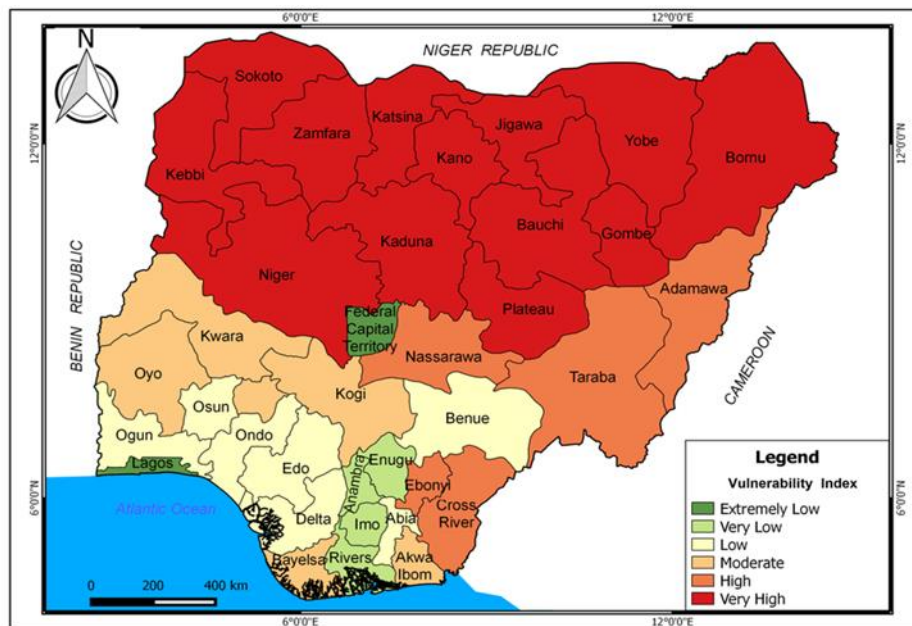
(a) Impact assessment of Climate Change on Economy

Climate change has impact on Nigerian economy, including agriculture, hydropower, coastal areas, forestry, foreign exchange etc. Climate change reducing agricultural productivity and the country is experiencing more frequent and severe floods and inundations. This reduces food security and negatively impacts health and nutrition. Rising temperatures, droughts and reduced rainfall are straining Nigeria's hydroelectric power system. Rising sea levels are increasing the vulnerability of coastal areas and southern cities like Lagos to flooding and waterborne diseases (Ushakov, 2021). Sea level rise is affecting coastline, particularly Lagos, causing soil erosion, salinization and flooding. Drought and low rainfall, combined with high temperatures, have impacted the country's energy efficiency, disrupted agriculture and fisheries, reduced food security and damaged health and nutrition. Climate change poses a threat to assets as it increases the frequency and intensity of droughts, heat waves and severe floods in many parts of the country. These extreme weather events can damage crops and buildings, and threaten flora and fauna that prefer to travel (Pandy, 2017).

Impacts of climate change on Nigeria's environment and socio-economic conditions are making the country vulnerable. Desertification has led to agriculture and overgrazing, depriving large areas of northern Nigeria. In southern Nigeria, unprecedented and heavy rainfall has caused crop failures and displaced communities. The depletion of natural resources across the country in the face of growing population is putting serious pressure on food security (Sungkaew, 2020). As a result, the increasing demand for food has led to widespread conflict in Nigeria. Farmer-herder oppression has been prevalent for decades and has crippled the economy across the country. Nigeria currently faces many environmental challenges, some are exacerbated by climate change, that have negative impacts on many sectors, particularly agriculture, water and infrastructure. Nigeria is at risk of natural disasters and is prone to floods, storms, inundations, droughts and fires (Sifolo & Henema, 2017).

Nigeria's coastal states face widespread risks from storm surges along the coast, inland flooding and forest fires in the Niger Delta region and poor rainfall in the southeast. Nigeria is regularly affected by natural disasters such as floods and inundations. Low-income households are also more vulnerable to climate-related natural disasters. Agriculture, which is heavily affected by floods and inundations, is the main source of income for 80 percent of the rural population (Shafiai & Rashid, 2021). Climate change, deforestation, watershed degradation,

land use, urbanization, and expansion in flood-prone areas are contributing to the problems and impacts of floods and droughts increasing the risk.



In Nigeria, climate change is expected to increase the frequency and intensity of heavy rainfall events, increasing the risk of floods. Droughts and floods are expected to be severe in the eastern and central parts of the country, with major impacts on livelihoods. Droughts have led to famine, displacement, conflict and biodiversity loss. Increased floods and droughts caused by changes in rainfall and rising temperatures will affect food and water security. Heavy rainfall can cause soil erosion and waterlogging of crops, reducing crop yields and contributing to food insecurity. Recurrent flooding causes land degradation and soil erosion, causing significant disruption to agriculture and particularly affecting the livelihoods of the rural poor. Food security may be affected as some crops are vulnerable to heat and/or water scarcity. Households cannot grow enough crops and do not have enough livestock to meet their food needs. Conflict in the country continues to have a direct impact on people's food intake, and this is exacerbated by poor sanitation and food insecurity.

Table 1: Status of Natural Disasters in Nigeria, 1900–2020

Natural hazard	Subtype	Events Count	Total Deaths	Total Affected	Total Damage*
Landslide	Landslide	3	32	1800	0
Storm	Convective Storm	3	54	16,012	1000
Insect Infestation	Locust	1	na	na	0
	Grasshopper	1	na	na	0
Flood	Riverine Flood	28	1,110	10,275,064	636,717
	Flash Flood	6	330	109,165	7,805
Temperature	Heat Wave	1	60	na	0
	Cold Wave	1	18	na	0
Epidemic	Viral Disease	24	8,233	182,474	0
	Bacterial Disease	27	17,278	163,378	0

Drought	Drought	1	0	3,000,000	71,103
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Source: Climate risk country profile- Nigeria, published by the World Bank Group, p. 12, Note: *total damage shows in '000 USD.

Table 1 discusses the nature of natural disasters in Nigeria. Floods and natural disasters occur more than other natural disasters. Agriculture is critical to the Nigerian economy and the country's overall food security. Nigerian agriculture is dominated by smallholder farmers and has limited mechanization. Climate change such as heat and cold, increased frequency and use of heavy rainfall events, prolonged droughts and crises should pose a threat to the country's agriculture. These trends can affect livestock production in arid and semiarid regions, affecting ecosystems due to excessive pasture pressure and the direct effects of higher temperatures on livestock. Rising temperatures can also shorten the growing season due to changes in seasonal rainfall patterns, which is expected to further impact crop production. The sensitivity of agriculture to climate and high productivity of rainfall and water have significant implications for Nigerian farmers and the economy. A significant portion of the Nigerian population is at risk of water scarcity. Changes in rainfall have led to flooding in wetlands in the southern part of the country, while lower rainfall in the northern savannah can cause drought that depleting soil water. Changes in runoff and groundwater flow in shallow basins can long-term impacts on both permanent and seasonal water levels. Delta, Bayelsa, Anambra, Lagos and Kogi states of Nigeria, including coastal and floodplain areas are all vulnerable to climate change. Drought and desertification affect health of these areas by causing loss of biodiversity, loss of land cover and depletion of water.

Prolonged droughts in particular lead to crop failures and livestock deaths, increasing food insecurity and the potential for famine in the regions. Northern regions are often at risk due to hot weather and low rainfall. Changes in water availability, combined with increasing demand, have the potential to lead to political tensions over water ownership and use. Rising temperatures will increase evaporation rates, particularly in the eastern and central Niger Basin, which will impact water resources. Heavy rainfall will increase the risk of flooding and inundation, which will affect water quality and infrastructure, causing more stress on crops and livestock. In Nigeria, where the largest source of energy production and export comes from oil and gas, coastal resources are vulnerable to rising seas, storms and coastal flooding. Nigeria's energy demand will increase due to rising temperatures, and the biomass available for fuel will decrease due to evaporation rates. The frequency of heavy rain events could lead to more frequent and intense flooding and storm surges, which can damage and disrupt electrical equipment, including transmission. Adverse weather events such as heavy rainfall can damage

buildings, roads, communications and disrupt supply lines. The frequency and intensity of heavy rainfall and floods can affect infrastructure and energy production.

In the north, wind erosion is sweeping away homes and farms, causing deforestation, drought, overgrazing and desertification. The climate crisis has caused more hardship in many cities in the Sahel. In the south, floods and droughts caused by climate change are devastating cities. In Nigeria's commercial capital (Lagos) rising sea levels each year almost always cause seasonal flooding. Climate change is also affecting forests through erosion and storms, leading to a decline in forest products such as timber and sugar cane. Nigeria's rapid population growth and unparalleled agricultural productivity pose a serious food security challenge. This has been linked to climate change stress. The closure of numerous water wells in Niger Delta points to the negative consequences of climate change. Such losses undermine the livelihoods of riverine communities that depend on them for food cultivation. Food insecurity is one of the most significant impacts of climate change. Climate change poses new threats to human security. The continuous destruction of the environment in the northern Nigeria region has led to the loss of pastures and has caused the herders to move south. The main consequences of this migration pattern are a conflict between farmers and the pastoralist community.

Nigeria's economy is the main source of activity because the country is diverse but also includes forests, savannas, waterfalls and other tourist attractions. Abuja is home to many parks and green areas, the largest of which is Millennium Park. Lagos is generally known for its business-oriented and fast-paced society. Lagos has several beaches on the Atlantic coast, e.g. Elegushi Beach and Alpha Beach. Lagos is also home to several exclusive hotels, Beach Resort and several resorts. The tourism sector is managed by the Federal Ministry of Information and National Development. Tourism is growing because it will contribute to the GDP through production and create a good environment for tourist.

(b) Impact assessment of Climate Change on Tourism Industry

Businesses are facing serious impacts of climate change. As temperatures rise, many places will become less attractive. The tourism industry will be affected by policy changes that contribute to global warming and efforts to reduce greenhouse gas emissions, especially in terms of the element of increasing emissions. The economy has a direct physical impact on climate change, such as rising sea levels and rising temperatures. It is also threatened by direct effects such as changes in water resources and the spread of certain diseases. Rising sea levels will have significant and diverse impacts on coastal tourism. Rising sea levels will erode and degrade some tourist attractions and places of interest such as beaches. Rising sea levels and

storm surges will cause erosion of beaches, sandbanks and cliffs. Many tourist destinations have freshwater resources and small islands often have dedicated freshwater resources. The decline of its availability or quality will affect the tourism industry. Climate change will have an impact on human health and safety, with the greatest impact on people who are vulnerable to malnutrition or food or water hygiene problems. New areas may be attractive to tourism. There is also some evidence that tourist visiting areas and natural events are at risk from warming.

Nigeria is famous for delicious cuisine, beautiful landmarks, and for its rich traditions and culture. It has diverse system of rivers, mangrove swamps, tropical rainforests, undulating hills, exotic flora and fauna and fantastic peoples. It has eight national parks. Lake Chad and Oguta Lake are the most popular lakes in Nigeria. There are many natural lakes and man-made like exist in the country. Niger and Benue are the major rivers. Mount Dimlang, Maisajeh Hill, Tsaunin Ukuru, and Tsaunin Kura are the major mountains. Abiriba village that located in Abia State is called as "Small London." It is the most beautiful village in Nigeria. Idanre Hills is the well-known hills station. Agbokim Waterfall, Gurara Waterfalls, Farin Ruwa Waterfall, Owu Waterfall, and Matsirga Waterfall are the another attraction for travellers. An Noor Mosque, Synagogue church, Central Mosque of Lagos, Oduduwa Shrine and Grove, Central Mosque, Ilorin Central Mosque, Sultan Bello Masjid, Sultan Palace Hall Sokoto, and Zaria Central Mosque are the popular religious sites.

Lagos, Kano, Ibadan, Kaduna and Port Harcourt are major cities. Lekki Conservation Centre, Freedom Park, Nike Art Gallery, and Landmark Leisure Beach are the major attraction of Lagos. Emir's Palace, Kurmi Market, Dala Hill, Gidan Makama Museum, and Central Mosque are the popular tourist sites in Kano. Ibadan is popular for Suspended Lakes, Ado Awaye Mountains, Agodi Gardens and Bower's Tower. Kaduna is called as Nigeria's largest textile-manufacturing centre. It is also called crocodile city. Nok Village, Kajuru Castle, Splash Park, Kamuku National Park, Kaduna National Museum, Emir of Zazzau Palace, Golf Club, and Saint Bartholomew's Church are the major tourist attractions. Port Harcourt is known as chief oil-refining city in Nigeria. Garden City Amusement Park, TCK Family Park Rutaland, Genesis Deluxe Cinema, Port Harcourt Zoo, and Rivers State Museum are the popular tourist sites in Port Harcourt. Nigeria is also well-known are the delicious foods. Some of them are Pounded Yam, Jollof rice, Afang Soup, Akara/Kosai, Efo Riro etc.

Table 2: Number of Hotels and Similar Establishment in Nigeria

Year	Number	Year	Number	Year	Number
2001	1255k	2008	1497k	2015	27403k

2002	1392k	2009	1647k	2016	27724k
2003	1502k	2010	1860k	2017	28278k
2004	1509k	2011	9250k	2018	28843k
2005	1880k	2012	14008k	2019	29149k
2006	1974k	2013	17110k	2020	29149k
2007	2012k	2014	21036k	2021	29149k

Source: <https://www.unwto.org/tourism-statistics/key-tourism-statistics>

Table 2 represented number of hotels and similar establishment in Nigeria. It has found that number of such establishment are increased since 2001. Number of such establishment was 1255 thousand in 2001 and was 9250 thousand in 2010 and 29149 thousand in 2021.

Table 3: Total number of Bed places for tourist in Nigeria

Year	Number	Year	Number	Year	Number
2001	27678k	2008	43875k	2015	568556k
2002	30699k	2009	55455k	2016	627424k
2003	37528k	2010	63773k	2017	639972k
2004	37738k	2011	277522k	2018	652771k
2005	38870k	2012	345514k	2019	665826k
2006	40814k	2013	367972k	2020	665826k
2007	42723k	2014	417368k	2021	665826k

Source: <https://www.unwto.org/tourism-statistics/key-tourism-statistics>

Table 3 discussed the total number of bed places for tourist in Nigeria. It has found that number of such bed places was increased since 2001. Number of such bed places was 27678 thousand in 2001 and was 277522 thousand in 2011 and 665826 thousand in 2021.

Table 4: Average length of stay in hotels and similar of Tourist in Nigeria

Year	Nights	Year	Nights	Year	Nights	Year	Nights	Year	Nights
2012	5	2014	7	2016	7	2018	6	2020	3
2013	7	2015	8	2017	7	2019	7	2021	7

Source: <https://www.unwto.org/tourism-statistics/key-tourism-statistics>

Table 4 discussed the average length of stay in hotels and similar of tourist in Nigeria. It has found that average length of stay in hotels and similar of tourist were changed frequently. the average length of stay in hotels and similar of tourist was five nights in 2012 and six nights in 2018. Average length were seven nights in 2013, 2014, 2016, 2017, 2019 and 2021. Average length was only three days in 2020 due to corona pandemic.

Table 5: Arrival of tourist and Revenue of Tourism industry in Nigeria

Year	Tourist	Receipts	% of GDP	Year	Tourist	Receipts	% of GDP
1996	0.656	47	0.11	2009	6.050	791	0.27
1997	0.611	83	0.15	2010	6.110	736	0.20
1998	0.739	81	0.15	2011	3.770	688	0.17
1999	0.776	99	0.17	2012	4.670	638	0.14
2000	0.813	186	0.27	2013	4.040	616	0.12

2001	0.850	168	0.23	2014	4.800	605	0.11
2002	0.887	256	0.27	2015	6.020	461	0.10
2003	0.924	58	0.06	2016	5.270	1009	0.27
2004	0.962	49	0.04	2017	1.930	2620	0.70
2005	1.010	139	0.08	2018	1.970	1980	0.47
2006	3.060	209	0.09	2019	2.010	1470	0.31
2007	5.240	337	0.12	2020	0.500	321	0.07
2008	5.820	958	0.28	2021	0.518	265	0.06

Source: <https://www.worlddata.info/africa/nigeria/tourism.php>, **Note:** Tourist arrivals in million, Receipts in million USD.

Table 5 discussed the arrival of tourist and revenue of tourism industry in Nigeria. It has found that tourist flows in Nigeria has positive trends, but it declined in certain period due to certain factors. Arrivals of tourist was 0.656 million in 1996 and 6.110 million in 2010. Arrivals of tourist was declined during 2020-2021 due to the corona pandemic. Number of arrived tourist was 2.010 million in 2019 and was reached 0.500 million in 2020 and 0.518 million in 2021. Lockdowns, and travelling restriction, due to the corona pandemic are key factors behind the sudden drop of the tourist arrivals. Therefore, the null hypothesis-1 is rejected and alternative hypothesis is accepted, i.e. There is impact of corona pandemic on tourist arrivals in Nigeria.

Total receipts (revenue) from tourist sector and its contribution in gross nation product of Nigeria is not stable. It was often fluctuated in last 25 years. Total receipts from tourism sector was 47 million USD in 1996 and was 688 million USD in 2011 and 2620 million USD in 2017. Revenue from the sector was declined during 2020-2021 due to the corona pandemic. Share of tourism sector revenue in gross domestic product is negligible. Contribution of tourism sector in GDP was 0.11 percent in 1996 and 0.28 percent in 2008 and 0.70 percent in 2017. Contribution of the sector in GDP was unexpectedly being declined during 2020-2021 due to the corona pandemic. We will now use regression analysis between arrivals of tourist and percentage contribution of tourism industry on GDP of Nigeria to measure relation between the two variables.

Table 5 (a): Summary Output

Regression Statistics	
Multiple R	0.056313985
R Square	0.003171265
Adjusted R Square	0.038363266
Standard Error	0.146695329
Observations	26

Source: Calculated by author.

Table 5 (b): ANOVA Analysis

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.001643069	0.001643069	0.076352491	0.784668249
Residual	24	0.51646847	0.02151952		
Total	25	0.518111538			

Source: Calculated by author.

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.182497813	0.046784941	3.900781133	0.000676801
Tourist	0.003786202	0.013702259	0.276319546	0.784668249

Source: Calculated by author.

The table 5 (a) shows R Square value is 0.003171265. It means there is no relationship between number of tourist arrivals and its revenue share in gross state domestic product in Nigeria. Table (5-b) shows that p value (0.192) is higher than critical value at 5% level of significance ($p > 0.05$), therefore we will accept the null hypothesis-2. So, it is concluded that There is no relationship between tourist arrivals and its contribution in gross domestic product of Nigeria.

Therefore, tourism is a newly developing sector in Nigeria, but its contribution to the country's income is not significant. There are many reasons for this. The safety and security of travellers is the main reason. Banditry is increasing in many places, especially in the northwest. Kidnapping and extortion cases are increasing. They often use motorbikes to rob and steal, and anyone who resists will be killed. Militants are killing farmers, pilgrims and traders in rural communities. Climate change has many negative impacts on the tourism sector. Floods, storms, heat waves and droughts can make tourists feel unwelcome and unfit to visit. Coastal flooding and erosion threaten the integrity of beaches and tourist sites. Climate change is affecting the flora and fauna that are at the heart of African tourism. Extreme weather events can damage infrastructure that supports tourism. Climate change can lead to water scarcity and competition for water between tourism and other activities. Coastal flooding and increased erosion are affecting coastal tourism and tourism infrastructure.

Initiatives of Government

Nigeria's National Climate Change Policy 2021-2030 is helping the country achieve its goals of effectively reducing greenhouse gas emissions and mitigating the negative economic impacts of climate change. In 2021, the Nigerian government updated its national resolution in line with the United Nations Mission on Climate Change and the Paris Agreement, which set an unconditional aid target of reducing emissions by 20 percent compared to state emissions by 2030, with conditions. The target is to reduce greenhouse gas emissions by 47 percent below

2018 emission levels, based on international support. National Climate Change Commission was established in 2021 under the Climate Change Act to address climate change and achieve greenhouse gas reduction targets.

Nigerian National Adaptation Plan Architecture (2020) sets out Nigeria's adaptation targets, the principles that guide changes, and facilitates the implementation of key adaptation measures. Nigerian Energy Transformation Plan outlines Nigeria's commitment to become carbon neutral by 2060 in five key areas: electricity, cooking, oil and gas, transportation and industry. Launched in 2012, the concept uses a new, integrated approach based on community participation. The programme links poverty reduction with sustainable ecosystems and better protection against disasters. It supports measures to help reduce greenhouse gas emissions. It introduces agriculture and new technologies such as energy-saving, solar-powered healthcare facilities, pumps, dryers and plant farming to reduce carbon emissions, deforestation and dependence on fossil fuels. It includes safety studies and security measures including the role of LPG in reducing dependence on wood and gasoline, feasibility studies for solar power plant projects, fuel transportation and digital environmental assessments.

Conclusion

Nigeria is affected by the climate change and natural disasters. Nigeria's climate has changed as a result of: rising temperatures and rising sea levels. Many livelihoods, agriculture and crops are threatened by climate change. Rising sea levels increase the risk of floods and waterborne diseases. Droughts and temperatures affect agriculture and fisheries, reducing food quality, and affecting health and nutrition. The effects of change will be difficult to disentangle and could be long-lasting. Rainfall variability is expected to increase, with rainfall expected to increase in southern regions and sea level rise expected to rise flooding and coastal inundation. Droughts are expected in northern Nigeria due to heavy rainfall and rising temperatures. Lake Chad and other lakes in the country are drying up and are in danger of disappearing. To improve flood protection, Nigerian states, especially those in coastal areas (Delta, Bayelsa, Anambra, Lagos and Kogi) and flood parks should be included in the country's climate change adaptation model.

In Nigeria, increasing climate change is causing more droughts and untimely rainfall. As one of the ten countries most vulnerable to the effects of climate change, land degradation is worsening due to floods, mudslides and waterlogging. Sudden, unpredictable, uncontrollable floods that erode land and cause loss of life and property are a nightmare for many Nigerians. Although tourism sector is not developed in country, but climate change negatively affecting

the sector. The role of poor governance in fuelling the challenges of climate change cannot be ignored. Nigeria needs to adopt and implement reform strategies to cope with the challenges of climate change and achieve food security through sustainable agriculture. Appropriate laws and regulations should be put in place to ensure good environmental practices. Smart food systems or climate change resilient agriculture should be adopted to ensure food security. Drought-resistant pastures should be established and expanded in drought-affected areas.

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