# PERCEPTIONS OF CLIMATE CHANGE: A STUDY OF UNIVERSITY STUDENTS IN KOGI STATE OF NIGERIA

**BY**

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## DECLARATION

I, Peace Ilemona Attah, declare that this thesis is my own original work, and it has not been presented and will not be presented by me to any other university for similar or any other degree award, and all sources of material used for this thesis have been duly acknowledged.

Signature: 

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Date: 24.03.2025

## ADVISOR APPROVAL SHEET

This is to certify that the thesis entitled **"Perceptions of climate change: A study of university students in Kogi state of Nigeria"** submitted in partial fulfilment of the requirements for the degree of **Master of Science in Climate Change Policy,** the Graduate Program of the **Pan African Institute for Water and Energy Sciences (incl. Climate Change),** and has been carried out by Peace Ilemona Attah Id. No **PAUWES/2023/MCCP09**, under my supervision. Therefore, I recommend that the student has fulfilled the requirements and hence hereby can submit the thesis for defence.

| **Dr. Stanley U. Okoro** | _____ | **24.03.2025** |
|---|---|---|
| **Name of Principal Advisor** | **Signature** | **Date** |

## DEDICATION

This work is dedicated to God and my family for being my source of motivation and support.

## EXAMINER'S APPROVAL PAGE

This topic: Perceptions of climate change: A study of university students in Kogi state of Nigeria

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**ABSTRACT**

Every area on the planet inhabited by humans is already experiencing the effects of climate change, with human activity responsible for many of the observed extreme climatic condition and changes in weather. Africa, particularly Nigeria, is among the continent's most susceptible to the effects of climate change. It is especially susceptible to the consequences of climate change because of its heavy reliance on rain-fed agriculture, pervasive poverty, and little capacity for adaptation. This study aimed to assess the perception of climate change among university students in Kogi State, Nigeria. The methodology employed encompassed a sampling design utilizing data collection instruments such as questionnaires, interviews, and focus group discussions. The research examined the level of awareness of climate change, climate risks and its impacts on student and their local environment. The study also examined the accessible and available medium for knowledge about climate change in selected universities. Furthermore, this is critical, particularly in terms of providing the students with the knowledge they need to adapt to and lessen the effects of climate change. It investigated the role of the selected universities in climate change education. The study adopted a descriptive survey design to collect primary and secondary data. Results revealed that there is generally high awareness of climate change among university students, with over 95% of respondents from each university. The findings also reveal that 84.9% of the respondents acknowledge climate change as a risk to their environment, while the other respondents either do not know or are uncertain. Half of the respondents were neutral about their university's role in climate change education, 34.75% expressed that it was effective and 15.1% expressed that it is ineffective. This explains that the university is not doing enough in terms of climate change education. The results also show that climate change education is not included in the curriculum of some of these universities. It is necessary to take more steps to build their capacities for facing this future challenge and encouraging engagement in combating the effects of climate change. It is also necessary that more courses addressing the causes and impact of climate change be added to the curriculum and universities should continually play an active role in climate change education.

**Key words: Students, Climate change, Climate change adaptation, and perception**

# CHAPTER ONE

# INTRODUCTION

## 1.1 Introduction

Climate change is perceived as the most worrying environmental, economic, and social threat facing humankind globally (Okonya et al., 2013; Thinda et al., 2020; Calculli et al., 2021).

The change in climate is known to be responsible for nearly 5.5 million Disability Adjusted Life Years (DALYs) lost by 2000. Other countries around the world including Nigeria is directly visible to changing climate, through changes in the patterns of weather and through indirect changes in air, water, quality and quantity of food, agriculture, livelihoods, ecosystems and infrastructure. For example, annual precipitation has decreased in space and time through the reduction of 100-311mm depending on topography and the location ((Raimi et al., 2018) Between 1970 and 2000, many parts of Nigeria had witnessed variations in onset and retreat of rainfall relative to the period 1941-1970 (Ariko Joseph et al., 2024). For instance, erosion of soil is one of the utmost conspicuous land surface features in South-Eastern Nigeria which has negatively impacted on the general land use in the area (Agwu, 2024).

(Raimi et al., 2018) examined the impact of changing climate on many Nigerian economy sectors. He warned that global warming effects and Nigeria changing climate are at present a concern to individuals, institutions, businesses, governments, environmentalists, trade, and policy makers.

To lessen the effects of climate change, accurate information, and awareness—especially among young people—are essential (Otto & Kaiser, 2014) (Rousell & Cutter-Mackenzie-Knowles, 2020) (Feldbacher et al., 2024). They resolved through recommending that the governments could play an important role in information dissemination on the probable/concrete impacts of changing climate by way of projecting impacts on water resources, agriculture, and diseases (Raimi et al., 2018) (Gift et al., 2020).

Education is an essential element of the global response to climate change (Tasquier et al., 2014)(Hung, 2022) (Dillon & Herman, 2023). Climate change education helps young people comprehend and address the impact of global warming. Furthermore, it encourages changes

in their attitudes and behaviour and helps them adapt to the climate change related trends (Karami et al., 2017) (Kolenatý et al., 2022) (Villamor et al., 2023).

In recent years, awareness of environmental issues has grown around the world. Both young people and adults share the goal of saving our planet, which is suffering from increasing climate change and disasters. This is one of the most frightening concerns for people in developing countries (Calculli et al., 2021). The Intergovernmental Panel on Climate Change in 2018 and UN 2020 Agenda goals also identified climate change as a real concern.

This paper assesses the perception of climate change amongst students studying in higher institutions of learning in Kogi State, Nigeria. It examines the accessible and available medium for knowledge about climate change in these universities in more detail. This is crucial, particularly in terms of providing the next generation with the knowledge they need to adapt to and lessen the effects of climate change.

**1.2 Problem statement**

Global climate change is an important problem in this time. The climate is constantly changing due to many different natural factors. A significant new factor, which has been influencing the Earth's climate more and more in the last 200 years, has become human activity. Its impact is defined by the so-called greenhouse effect ( Cloy et al., 2017; Chehabeddine & Tvaronavičienė, 2020; Mikhaylov et al., 2020).

Nigeria, like any other developing country, is affected by climate change and this poses a huge threat to poverty eradication and sustainable development (Okon et al., 2021). In terms of vulnerability, Nigeria has about 95.6 million people living in rural areas who depend on natural resources, which are climate sensitive for their livelihood (Ucheje et al., 2024).

In Nigeria, in 2018, the National Emergency Management Agency (NEMA) reports that heavy rain across the country caused by Niger River and Benue River to overflow leading to flood which affected four states including Kogi State at the figure of 441,251 people being affected and 108 casualties (Umaru & Hafiz, 2019). The Kogi State Emergency Management Agency (KSEMA) reported that over forty-five (45,000) persons were displaced by flood across the state hitting houses, clinics, churches, mosques, farmland, and even the state High Court (Zakari & Sheidu, 2021). Before this, earlier September 24th 2012, NEMA reported that about two million people in 350 communities spread across nine Local Government Areas of Lokoja, Kogi were rendered

homeless by flood with at least 623,690people displaced (Zakari & Sheidu, 2021). According to the report of Floodlist (2020) and The Punch (2020), Kogi state also witnessed another flooding on September 14th, 2020 from the overflowing of the River Niger which affected about fifty thousand (50,000) people, sixty-six (66) communities, with under ascertained number of deaths in the state.

The involvement of students in the Sustainable Development Goals (SDGs) is crucial for fostering sustainable practices and enhancing educational outcomes. Research indicates that active student participation not only raises awareness but also drives meaningful action towards achieving these goals (Leal Filho et al., 2023).

Climate change is quite an important subject in the discourse of development in the modern world. However, in spite of its significance, there is yet no clear evidence on whether this increasingly pressing subject has been clearly or commonly understood amongst students.

Different studies indicates that there is "average" level of knowledge regarding climate change amongst students, while most students had difficulty in identifying the causes of climate change (Pael, 2021) (Ofori et al., 2023).

(Adetayo, 2022) conducted research in Adeleke University, Nigeria to examine the knowledge and attitude of university students towards climate change as well as the priority given to this issue in Nigeria. This study revealed a prevalent unconcerned attitude towards climate change, linked to the sources of news consumed by students.

More than five million young Nigerians are enrolled in higher education programs at various universities both domestically and abroad, making them a valuable resource for raising awareness of climate change (Eshiemogie et al., 2022). Inherently, to effectively create a national climate change awareness strategy, it is necessary to fully understand the level of youths' knowledge and perception of the climate change phenomenon, particularly with regard to its causes, impacts, and potential mitigation and adaption strategies. This will be beneficial for planning and formulating future climate change policies and strategies not only for Kogi State but for the rest of the country at large.

This research is based on the assumption that the poor implementation of climate change mitigation and adaptation policies is due to the schism that exists between low awareness and misinformed conceptualisations of university students about climate change.

## 1.3 Research objectives

### 1.3.1 Main Objective

The main objective of this study was to assess the perception of university students on global climate change.

### 1.3.2 Specific Objectives

1. The study assessed the level of awareness and understanding of global climate change among university students.
2. The study explored the attitudes and perceptions of university students towards global climate change, climate risks and its impacts of on their local environment.
3. The study analysed the role of educational institutions in shaping students' knowledge and perceptions of global climate change in Kogi State.

## 1.4 Research questions

1. What is the level of awareness and understanding of global climate change among university students in Kogi State?
2. How do university students in Kogi State perceive the impact of global climate change and climate risks on their local environment?
3. What role do educational institutions play in shaping the knowledge and perceptions of university students in Kogi State regarding global climate change?

## 1.5 Justification/ relevance of study

The motivation for the research was to investigate the perceptions of climate change among university students who are regarded as highly knowledgeable in the matter of climatology and environmental affairs. Regarding understanding the current crisis surrounding climate change, its impact and adaptation, the study thus focused on the understanding and response towards climate-change, the risks, its impacts and adaptation of university students in Kogi State of Nigeria. The study impacted on current and future climate-change adaptation, and policy-making on how to care for the environment in Nigeria. Even among some university students who have committed to studying environmental management, there still exists perceived variations in their understanding of the causes of climate change.

## 1.6 Hypothesis

1. Alternative hypothesis ($H_1$): There is a difference in the university students' perception of global climate change based on the demographic factors such as age, gender, or field of study.
2. Null hypothesis ($H_0$): There is no difference in the university students' perception of global climate change based on the demographic factors such as age, gender, or field of study and their perceptions vary based on demographic factors such as age, gender, or field of study.

## 1.7 Scope of the study

### 1.7.1 Geographical Scope

This research was conducted at three tertiary institutions: Federal University Lokoja, Prince Abubakar Audu University, and Salem University Kogi State, Nigeria.

### 1.7.2 Content Scope.

The study focused on analysing the perceptions and knowledge level of the students from different departments in these universities. It analysed how their background, age, program of study and level of study affects their perceptions of the global climate change issue.

### 1.7.3 Time Scope

The research was conducted for five months, from November 2024 to April 2025. The data used was collected at the universities stated above.

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Climate change

Significant, long-term changes in the world's climate are what are referred to as "climate change." Extreme weather conditions, increasing ocean conditions, shifting wildlife populations and lands, as well as a variety of other effects, are all part of it in addition to rising temperatures. The sun, the earth, the oceans, the wind, the rain, the snow, the forests, the deserts, the ups and downs, and everything that people do together make up the global climate. Climate change can be a natural process where temperature, downpour, wind, and other particles vary over decades or further. In millions of ages, our world has been warmer and colder than it's now. But now we're witnessing rapid-fire warming from man exercise, primarily due to burning fossil energies that bring about greenhouse gas flows (Fastfacts.com). Greenhouse gas flows that pan out Fossil fuel extraction and burning are significant causes of air pollution and climate change (Yoro & Daramola, 2020).

## 2.2 Global climate change

Global climate change is an important problem in this time. It leads to a gradual increase in the average annual temperature of the planet. Extreme weather in recent years has made the talks about the growth of Earth’s temperature more intense. The change in temperature is explained by high levels of manufacturing and economic activity that includes emissions of main greenhouse gases: carbon dioxide, methane, etc. (Mikhaylov et al., 2020).

The climate is constantly changing due to many different natural factors. A significant new factor, which has been influencing the Earth's climate more and more in the last 200 years, has become human activity. Its impact is defined by the so-called greenhouse effect (Chehabeddine & Tvaronavičienė, 2020).

In the past ten years, the problem of climate change caused by anthropogenic activities has become the most serious amongst environmental issues. This problem is also adjacent to population growth, deforestation, globalization, economic growth, production and consumption of industrial goods (Cloy et al., 2017).

## 2.3 Climate change in Nigeria

Nigeria, like any other developing country, is affected by climate change and this poses a huge threat to poverty eradication and sustainable development (Okon et al., 2021). In terms of vulnerability, Nigeria has about 95.6 million people living in rural areas who depend on

natural resources, which are climate sensitive for their livelihood (Ucheje et al., 2024). Rural areas and social groups were identified as the most likely to experience the effects of climate change unequal (O'Neill et al., 2020). This is in addition to Nigeria's natural ecosystems including freshwater and coastal resources that are highly exposed to the impacts of climate change prompting its classification among the ten most vulnerable countries in the world in the 2017 climate change vulnerability index (Brigid et al., 2022). Crucially, the vulnerable such as the elderly, children, ethnic minorities, homeless, low-income communities, and people in high-risk areas, mostly lack an awareness of climate change impacts and the ability or capacity to adapt to climate change disturbances (Lindley et al., 2011).

Climate change affects societal classes, income groups, occupation, age and gender in different ways (Amobi & Onyishi, 2015). Due to the climate impact on agricultural sector, women are affected disproportionally as most women are poor farmers who rely on small scale and rain-fed agriculture (Onwutuebe, 2019) and it also affects more women due to cultural division of roles between men and women. Women mostly depend on natural resources and are responsible for gathering wood for cooking, collecting the household water supply, and ensuring food security for the family. Children are also affected as flood could result in their absence from schools, particularly within communities with poor transportation and scarcity of food, which could lead to hunger and undermine children's ability to learn (Amanchukwu et al., 2015). The economy of Nigeria is highly affected by climate change due to climate sensitive sector like agriculture and productivity can have an adverse effect on Gross Domestic Product (Ogbuabor & Egwuchukwu, 2017). Agriculture has been a source of livelihood to communities for centuries. Over 70 percent of the population depend on agriculture for their livelihood (Onwutuebe, 2019). Nigeria resides in a semi-arid region which is largely affected by changes in temperature and rainfall, causing drought and floods, thus agriculture in these regions is predicted to become unsustainable (Azare, Abdullahi, et al., 2020). Most researchers have reported that climate change leads to significant decrease in agricultural productivity in Nigeria (Onyeneke et al., 2018). Similarly, changes in climate is projected to affect crop cultivation and yield in most parts of the country, making it difficult for farmers to plan their operations (Anabaraonye et al., 2018). Moreover, climate change events like flood and drought can undermine economic growth through losses in production and infrastructure and need for extraordinary spending (Ogbuabor & Egwuchukwu, 2017).

There is evidence that climate change has a huge effect on human health (Olalekan et al., 2018). The impact of climate change on human health in Nigeria could be direct or indirect, with vulnerable people such as children, pregnant women, elderly, poor population, and individuals with disabilities and chronic sickness affected the most (Hathaway & Maibach, 2018). One of the main consequences of climate change on the health of Nigerians are cerebra-spinal meningitis, cardiovascular respiratory disorder in the elderly, high blood pressure, skin cancer, tuberculosis, malaria, diarrhoea and cholera (Adebayo, 2022). These infectious diseases are potentially exacerbated by climate change. Due to excessive heat in Nigeria, incidences of meningitis has been on the rise (Oluwatimilehin et al., 2022). About 35% of reported cases from World Health Organisation (WHO) on meningitis outbreaks in Africa are from Nigeria, with 95% of the diseases from the northern part of the country (Peletiri et al., 2023). Other health impacts include air pollution from burning of fossil fuel from generators and transportation industries. As a result, the World Health Organisation projected that by 2070, over 400 million people will be at risk of malaria due to high and low emissions (Organization, 2014).

The energy sector is also affected by climate change through its impact on hydroelectrical and thermal generation (Ebele & Emodi, 2016). The drought in the northern part of Nigeria, for example, decreases the availability of trees and biomass for fuel as it affects hydroelectric output. In addition, due to flooding in the coastal area, it affects power generation as damages are made on transmission lines and substation equipment (Souto et al., 2022).

### 2.4 Climate change in Kogi state

Climate change remains one of the contemporary issues upsetting the desire to accelerate the necessary phases of human development across the globe, the reason being that development in all its dimensions cannot be achieved in an ecologically inhabitable environment. In Nigeria, in 2018, the National Emergency Management Agency (NEMA) reports that heavy rain across the country caused by Niger River and Benue River to overflow leading to flood which affected four states including Kogi State at the figure of 441,251 people being affected and 108 casualties (Umaru & Hafiz, 2019). The Kogi State Emergency Management Agency (KSEMA) reported that over forty-five (45,000) persons were displaced by flood across the state hitting houses, clinics, churches, mosques, farmland, and even the state High Court (Zakari & Sheidu, 2021). Before this, earlier September 24th 2012, NEMA reported that about two million people in 350 communities spread across nine Local Government Areas of Lokoja,

Kogi, Ibaji, Igalamela, Ajaokuta, Ofu, Omala, Olamaboro and Idah were rendered homeless by flood with at least 623,690people displaced (Zakari & Sheidu, 2021). According to the report of Floodlist (2020) and The Punch (2020), Kogi state also witnessed another flooding on September 14th, 2020 from the overflowing of the River Niger which affected about fifty thousand (50,000) people, sixty-six (66) communities, with under ascertained number of deaths in the state.

### 2.4.1 Temperature

The line graph below displays the daily temperature anomalies in Kogi State from 1964-2024. Over time, the temperature anomalies show a more noticeable change. The smoothed line dips just below zero from the middle of the 1960s to the 1970s, indicating somewhat colder conditions than the long-term average. However, the smooth trend line rises above zero, indicating a general warming trend, beginning in the 1980s and particularly into the 1990s and beyond. This increasing trend is in line with more general patterns of global warming, suggesting that recent decades have generally been warmer than the historical baseline.

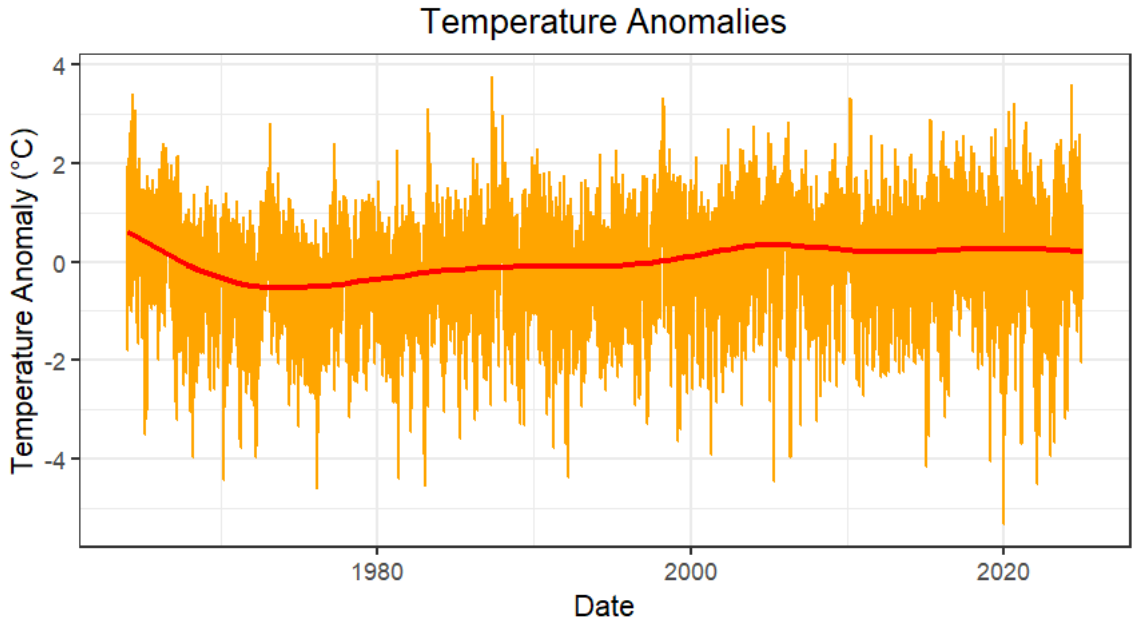


**Figure 2.1: Temperature Anomaly for Kogi State from 1964 – 2024**
**Source: Openmeteo**

### 2.4.2 Precipitation

The graph below displays the daily rainfall anomalies in Lokoja from 1964 to 2024. The plot indicates that daily precipitation is frequently near its historical mean, with the

majority of rainfall anomalies clustering around zero. Periods of significantly higher precipitation than the baseline are indicated by irregular increase, especially in the early 2000s. There is no evident upward or downward shift in rainfall amounts over the observed period, as indicated by the flatness of the red trend line. Rainfall shows a year-to-year variability.

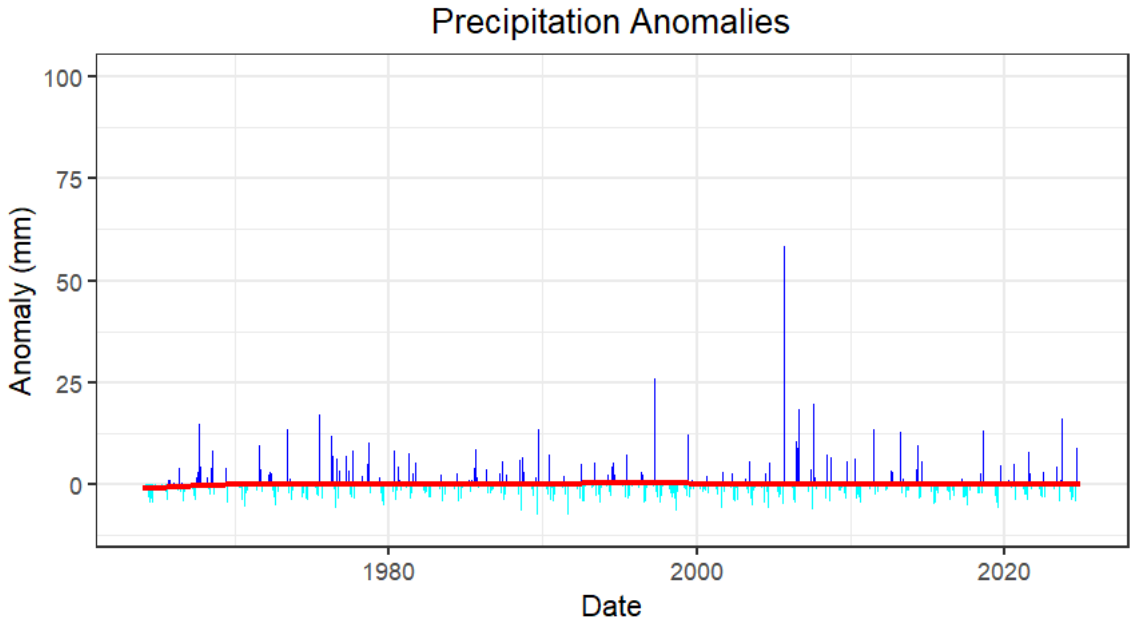


**Figure 2.2: Precipitation Anomaly for Kogi State from 1964 – 2024**
**Source: Openmeteo**

### 2.5 Perception of climate change in Kogi state

There is a consensus of perceived climate change variability among studies conducted in Kogi State, which found that respondents who were slightly aware of climate change perceived an increase in rainfall, increase in temperature, and increased sunshine. Furthermore, other respondents who were observed to be moderately aware of climate change perceived a decrease in temperature, increase in sunshine, increase in draught, longer raining season, decrease drought and soil erosion. This finding agrees with (Ekemhonye et al., 2023) who explained that the more the perceived impacts of climate change the more the adoption of adaptation strategies to mitigate climate change impact by the farmers.

Studies done on the perspectives of male and female indigenous farmers on climate variability indicated that perceived a decrease in frequency of rainfall (70.5% and 75.4%), increase in temperature (73.8% and 77.5%), increased duration of droughts (49.9% and 64.4%), increase in storm (67.6% and 48.2%), increase in flood (58.8% and 66.2%), increase

in heat waves (58% and 66%) and no change in hail (62% and 58%), (Ogunjinmi & Ogunjinmi, 2022).

Scientists in different parts of Nigeria have documented the evidence of increased temperature (Tarfa et al., 2019), low rainfall (Ogunjinmi & Ogunjinmi, 2022), increased drought (Kisauzi et al., 2012) and increased floods (Tarfa et al., 2019).

Another study looked at the perceptions about the causes or reasons for climate change using the 2018 flooding incident in Kogi state as a case study. 45% of the respondents perceived the cause to be rainfall, 3.1% perceived the cause to be from God (Osayomi et al., 2022). Similarly, according to a report by NEMA, August 2018, heavy rains across Nigeria were said to have caused large scale flooding that has already impacted 441, 251 people (Punch Newspaper, 2018). This conforms to previous studies such as a national study conducted in five hazard in Bangladesh zones, characterized, respectively, by drought, riverine flooding, flash flooding, cyclones, and salinity, showed that about 31% of respondents believed that human beings are responsible for climate change and about 46% that the responsibility lies with nature or God (Haq & Ahmed, 2020). Another study also found that respondents in Lagos identified heavy rainfall as a major cause of flooding (Adelekan & Asiyanbi, 2016). In Kosovo, heavy rains were perceived to be the main cause of flooding (Osayomi et al., 2022). Heavy rainfall, blockage of drainage was perceived as major causes of flooding in Benin City, Nigeria (Cirella et al., 2019). Rainfall was a major factor directly associated with flood hazard of Dire Dawa city. Duration, magnitude, and intensity of rainfall determine the formation of flood. Nearly 93 percent agreed that heavy rainfall is the cause of Dawa city flooding. Like Kogi State, Dire Dawa city where different river meets are the lowest point with an altitude of 100m above sea level. The location of Dire Dawa at the foot of the mountain chains in concert with other predisposing factors has exacerbated the flood risk in the city. The construction of settlements has aggravated flooding problem by reducing width of the riverbanks (Erena & Worku, 2018). Similarly, heavy and prolonged rainfall was the principal cause of flooding in Ibadan (Egbinola et al., 2017). Urban flooding in Kabul city is due to excessive rainfall and inadequate drainage among other factors (Manawi et al., 2020). The literature is heavy laden with the fact that extreme weather events expressed as heavy precipitation largely account for flooding (Okafor, 2021). Besides excessive rainfall, rapid and unplanned urban growth and poor physical control have significantly increased flood risk (Yan et al., 2020). Many Nigerian urban areas, Kogi inclusive, unfortunately lack drainage network

for waste and flood water, with many depending on rivers and tributary streams flowing through them, as outlets (Oladokun & Proverbs, 2016), and swampy, low lying flood prone areas which are cheap to acquire but expensive to develop, are increasingly being inhabited (Oladokun & Proverbs, 2016). Heavy rainfall, blockage of drainage was perceived as major perceived causes of flooding. Nearly 60 percent claiming that the government had not worked or constructed anything with regard to flood control (Cirella et al., 2019).

### 2.6 Universities and climate change

The role of universities in contributing generally to sustainable development and to climate change adaptation and mitigation is well documented. Sustainable development has become a significant field of research that describes how universities should contribute and fulfil their responsibilities (Barth & Rieckmann, 2013). There is a widespread view that universities have a key role to play in carbon reduction by reducing their own greenhouse gas emissions through campus greening, in partnership with other local actors, (Nhamo & Ntombela, 2014), and raising community awareness through capacity building interventions (Shiel et al., 2016). The university campus is an entity that consumes a considerable amount of energy which further increases greenhouse gas emissions (Cordero et al., 2020). Therefore, universities are ideal venues to serve as a living lab for the mitigation and adaptation efforts to the climate. Therefore, sensitizing university students with climate change could develop their confidence and knowledge to make the right choices on energy consumption so that they can contribute to the nurturing of ideal climate in the best interest of the wider community (Cotton et al., 2016).

Climate change education is very important and can also create a path for students to initiate climate change activism and work with various actors (Cordero et al., 2020). Despite the increasing importance given to education for sustainable development (ESD), few researches refer specifically to climate change education (Sterling et al., 2013). Less attention has also been given to systematically assessing the attitude, perceptions, and practices of students and the integration of the climate topic in the higher education institutions' curricula and co-curricular activities in a way that may guide changes in the curriculum and teaching practices. Universities have been identified as having a key role in educating students on the theoretical and practical aspects of the socio-economic and environmental impacts of climate change as well as mitigation and adaptation measures (Molthan-Hill et al., 2019), but previous research reports lack fewer details on the topic. Universities need to extend climate change education beyond the traditional technical subjects, emphasising the importance of

opening ways to foster a deeper understanding of climate change and ensuring that students have a broader and deeper understanding of the challenges.

### 2.7 Climate change and students' involvement

Organisations such as the United Nations (UN) and United Nations Educational, Scientific and Cultural Organization (UNESCO) have been stressing the need for climate change education, and this is reflected in the ever-growing significance to young people (Kuthe et al., 2020). According to (Akrofi et al., 2019), raising student awareness through education is crucial for encouraging active engagement in support of climate change actions at all levels of the society. Therefore, for students to become active participants who support research, create solutions for climate change adaptation and mitigation, and even take the lead in politics, universities must encourage them to get involved with the issues raised by climate change (Molthan-Hill et al., 2019). In order to empower students to move towards sustainability, efforts should be made to create educational programs that aim to raise climate literacy (Burkholder et al., 2017). It is essential that students participate in climate change adaptation and mitigation (Haq & Ahmed, 2020). According to (Akrofi et al., 2019), students' participation in workshops and campaigns pertaining to climate change had a major impact on their level of knowledge. The same study also showed that students' awareness and knowledge of climate change issues influence their attitudes and behaviours. This in turn suggests that their cognitive repertoire is influenced by their access to climate information, membership in environmentalist organizations, and degree of involvement in climate change courses, workshops, and campaigns. However, there is no established research agenda regarding how university students perceive climate change (Freije et al., 2017).

Their views on climate change differ depending on the fields they study (Haq & Ahmed, 2020), their exposure to climate-related risks and personal experiences, and their access to global media and the internet (Mugambiwa & Dzomonda, 2018). Studies have generally shown that formal and informal education influence university students' attitudes and perceptions of climate change, its causes, and its effects. (Li & Liu, 2022) argue that universities need to expand their curriculum to be sure that graduates understand the generally accepted scientific idea of climate change and its root causes so that they can help to solve it. For dealing with the direct and indirect consequences of climate change, student activity and engagement with adaptation and mitigation projects is important. However, since students have not reached the desired level of consciousness, educational curriculums on climate change need to be designed to positively affect students' perceptions about the

environment, and their courses should improve university students' scientific skills and knowledge that shape their attitudes and beliefs (Shaman & Knowlton, 2018).

### 2.8 University students' perception of climate change

Climate change is a serious global challenge that requires all sectors and actors working together. However, the awareness and concerns of the society for climate change and its impacts differ depending on factors like differences in economy, demographics, culture, educational level and background, and the degree of exposure to climate risks (Islam et al., 2017). University students form an important part of the community and can contribute significantly to the climate change adaptation and mitigation efforts within their university. The education and involvement of the students with the reality of changing climate and its impending risks serves as a way to equip these students with necessary information and skills so that they would encourage the larger community to adopt adaptation and mitigation measures for climate change (Leal Filho et al., 2023).

Different studies looked at how university students perceived climate change. For example, a study conducted by (Leal Filho et al., 2023) examined the perceptions of university students about the events, causes and concerns of climate change as well as their plans to participate in adaptation and mitigation measures in the future. This study indicates that most respondents are aware of the climate change issue, and most expressed concerns about the impending risks associated with climate change. According to a study conducted by (Akrofi et al., 2019), a small percentage of students voiced some doubt regarding the reality of climate change and, as a result, did not express concern about its consequences. Although it was lower than published studies on climate scientists, the percentage of students who attributed climate change to human activity was higher than other studies.

Universities can thus understand their students' awareness of climate change and its negative effects by assessing their attitudes and perceptions. This will enable them to be able to adequately integrate climate issues in the co-curricular activities and formal curriculum.

#### 2.8.1 Students' background/socioeconomic status and climate change

This social factor can be explained by the fact that different interactions with nature among rural people and urbanites influence how they perceive and feel about the environment (Salehi et al., 2016). Following this line of thought, some researchers have looked at the relationship between one's place of residence and one's knowledge or perception of climate change. For example, (Babaei, 2014) discovered that there was a relation between an

individual's place of residence and their degree of climate change knowledge and perception. They found that people living in cities are more conscious of climate change than people living in rural areas. On the other hand, others found no difference between people's knowledge of climate change and their place of residence (Salehi et al., 2016).

According to (Ofori et al., 2023), socioeconomic status is linked to perceptions and knowledge of climate change. Environmental concern is positively correlated with people's perceptions of their socioeconomic status in both developed and developing (Lübke, 2022). Wealthier people tend to have a better knowledge and greater concern about issues related to the environment and climate change than poor people (Sulemana et al., 2016). We used parents' level of education and employment status as a proxy for their socio-economic status. "High socio-economic status" was defined as parents who had completed their tertiary education and were employed in the formal sector, whereas "low socio-economic status" was defined as parents who had no formal education and were unemployed. Household size has also been shown to influence individuals and households action on climate change, with individuals from small household size more likely to have higher mitigation performance and perceived mitigation efforts on climate change (Ofori et al., 2023).

Results show that no difference was observed between rural and urban students and their knowledge of climate change (Salehi et al., 2016). This result is contrary to a number of previous studies conducted by researchers, such as (Babaei, 2014), who found that there was a positive relation between place of residence and knowledge of climate change. However, (Clarke et al., 2009) came to similar findings like we did in our study.

### 2.8.2 Students' age and climate change

Age also seems to influence climate change perception. about its causes valuation, main differences appear between the aged group 18–25 and 36–50, where the latter tend to assess a higher percentage of activities as the mean causes of climate change (Leal Filho et al., 2023). Regarding current studies, data suggest differences in levels of awareness and concerns about climate issues. There are statistical differences when comparing the youngest participants (18–25 aged) with the others. Participants declared a greater awareness as their age increased (Leal Filho et al., 2023). This conclusion is also supported by the Spearman correlation results, which indicate that there is a positive correlation (0.198) between age and awareness levels.

In virtually all countries older respondents were more likely to have doubts about the anthropogenic nature of climate change. In a majority of countries, older respondents were more likely to perceive fewer negative impacts, and to be less concerned about climate change. The association between age and concern was even significantly positive in Lithuania (Poortinga et al., 2019).

In a study conducted by (Leal Filho et al., 2023), they suggested that there are increasingly strong relationships between age and climate change awareness, perhaps where age and education might act as a proxy for personal experience and the ability to emotionally receive and make sense of the complexity of climate change issues.

### 2.8.3 Students' gender and climate change

Studies has shown that gender can influence individual's perception of climate change. Compared to men, women tend to declare in higher percentages that human activity is the main cause of climate change. They are more concerned and aware about climate change than men (Chowdhury et al., 2021). This could be because women and men are affected by climate change differently. For instance, women are 14 times more likely to die than men as a result of climate change related risks (Leal Filho et al., 2023).

Gender inequality is a major factor contributing to the increased vulnerability of women and girls in disaster situations, such as Hurricanes Mitch and Katrina and flooding in South and East Asia, that are being increasing linked to climate change. The World Conservation Union/Women's Environment and Development Organization (IUCN/WEDO) released a report stating that women and children are more likely to die in disasters than men (Garai, 2016).

Research consistently shows that women and rural communities are more susceptible to the negative effects risks of climate change than men (Ume et al., 2021). When it comes to gender differences, researchers argue that women are more concerned about the environment than men are and that they are actively participating in environmentalism (Andrew et al., 2020). This is being explained by the fact that women are generally more often in charge of family care and therefore have more contact with environmental services (Salehi et al., 2015), which makes them more likely to be affected by changes in the environment. This in turn might then also affect their perception on environmental changes such as GCC (G. F. Robinson, 2021).

Research from both developed and developing countries show that men and women have different levels of knowledge, perception, and concern about climate change, but the findings are largely inconclusive. While some studies found that men are more knowledgeable than women about climate change (Vicente-Molina et al., 2018), other studies found that women are more concerned and knowledgeable about climate change than men (Shi et al., 2016).

In a study conducted by (Haq & Ahmed, 2020), the cross-tabulations show that a relatively greater number of female students believe that climate change is a supernatural matter. In addition, the regression model reveals that a higher percentage of male students believe that climate change is caused by humans. Overall, these findings are in line with previous work by (Haq & Ahmed, 2017) and (M. N. Q. Ahmed & Atiqul Haq, 2019).

(Haq & Ahmed, 2020) conducted an analysis regarding students' perception on climate change in Bangladesh and it indicated that gender is a predictor that significantly explains the perceived causes of human induced climate change. The perception that climate change is due to human activities is higher for students for the male gender.

Results show that there exists a difference between female and male students in their knowledge and perception of climate change, with male students possessing a higher level of climate change knowledge than female students (Salehi et al., 2016). This result is contrary to results described by (Spellman et al., 2003). However, (Spellman et al., 2003), although detecting a higher level of knowledge of climate change among women, were surprised by their results since women are often assumed to have little interest in scientific matters and remain under-represented in most scientific fields.

### 2.8.4 Student's program of study and level of study and climate change

In a study conducted by (Leal Filho et al., 2023), climate change awareness and concern varied between disciplines, from the lowest relative awareness in business, administration and law (similar to (Akrofi et al., 2019), in terms of awareness) and the lowest relative concern in engineering, manufacturing and construction. In contrast, the highest level of awareness was in the disciplines of biology and the environmental sciences similar to (Mugambiwa & Dzomonda, 2018), and the highest level of climate change concern was in health and welfare. These findings were statistically significant and as such provide a new global analysis of disciplines in relation to each other in terms of climate change awareness and concern. This suggests the different ways that climate change is positioned and

understood in relation to other disciplinary concepts, which filter through to levels of awareness and concern (Treen et al., 2020).

In the same study conducted by (Leal Filho et al., 2023), level of student also seems to influence over awareness: undergraduate students tend to evaluate climate change lesser than post-graduate or PhD students. A similar pattern existed for the educational level, where climate change awareness and concern broadly increased from undergraduate to postgraduate levels. These findings contrast with some studies that suggest similar levels of awareness across levels (AbuQamar et al., 2015), but support others that indicate differences in experience over time (Ayanlade & Jegede, 2016). This study reflected the findings of other studies that indicated different levels of awareness across disciplines but also provided comparative data in relation to concern for climate change.

The level and programme of study can influence the knowledge and perception of undergraduate students in Ghana as shown in studies from other countries (Ofori et al., 2023). Generally, students pursuing science and environment related programme are more knowledgeable and have a better perception of climate change than those pursuing Humanities programme (Ofori et al., 2023). Also, the higher the level of education, the more knowledgeable and the better the perception of people about climate change(Wibeck, 2014). Therefore, undergraduate student who are in the science programme and those at highest level (i.e., level 400 students) were expected to be more knowledgeable and have better perception and attitude toward climate change.

Another study conducted by (Haq & Ahmed, 2020), the coefficients of academic discipline suggest that students in the Social Sciences, compared to their counterparts in other sciences, are more likely to attribute supernatural explanations as the causes of climate change. And these findings are also in line with previous work by (Haq & Ahmed, 2017) and (M. N. Q. Ahmed & Atiqul Haq, 2019).

Studies suggests that that students' perceptions about climate change vary according to the academic discipline in which they are enrolled in tertiary education. An important finding in our study is that there are variety of perceptions towards the causes of climate change according to discipline of study (Haq & Ahmed, 2020). Results gotten from this study shows that more students enrolled in the School of Social Sciences than in other disciplines perceive climate change as due to human activities. The predictor of academic discipline was significant only for explaining perceptions about changes in rainfall. For instance, Social

Sciences students are less likely to perceive a decrease in rainfall. Overall, the findings contradict those of previous studies conducted in Nigeria, the USA, and South Africa which reveal that students or teachers in the disciplines of science, agriculture, and environmental sciences had a better understanding of climate change compared to students in other sciences (Mugambiwa & Dzomonda, 2018).

Findings show that students' knowledge of climate change was influenced by their affiliation to a certain faculty or university department (Salehi et al., 2016). Students affiliated to natural-science faculties or departments ranked higher in comparison with the ones affiliated to non-natural science faculties or departments. This result is consistent with results obtained by (Spellman et al., 2003) and (Salehi & Pazokinejad, 2014).

### 2.9 Climate risks and university students

Climate risks refer to the potential negative impacts of climate-related changes on the environment, human systems, and infrastructure. These risks can be categorized into: physical risks, transition risks, health risks, liability risks amongst others (Huang et al., 2024).

The impact of climate change on university students is multifaceted, influencing their education, mental health, and future career prospects. University students' perceptions of climate change are shaped by their educational experiences and personal exposure to climate-related risks. (Calculli et al., 2021) highlighted that students who participate in climate change workshops and campaigns demonstrate significantly enhanced knowledge and awareness of climate issues. Despite this, many students remain uninformed about critical discussions, such as the outcomes of international climate conferences (COPs), indicating a gap in engagement that universities need to address.

Climate change poses significant risks to various sectors in Nigeria, including education (Akuraga & Uganden, 2024). University students are particularly affected by climate risks, which can disrupt their academic experiences and overall well-being. Students at universities, particularly in northern Nigeria, face extreme heat conditions that impede their ability to learn effectively (Ojeh et al., 2024). For instance, temperatures exceeding 40°C have made classrooms uncomfortable, affecting concentration and health. Students have reported that these conditions lead to frequent illnesses and decreased academic performance, highlighting the urgent need for universities to implement adaptive measures such as improved ventilation and cooling systems in classrooms (Ojeh et al., 2024).

Kogi State is experiencing various environmental challenges due to climate change, including flooding, droughts, and extreme weather events (CHARITY, 2024). These changes disrupt educational access and infrastructure, particularly affecting university students (Nche, 2024). The impacts of climate change on students in this region is supported by relevant research and publications. (Awuja, 2024) in his study highlights that climate change significantly impacts educational outcomes and student well-being in Kogi State. A descriptive analysis conducted on the effects of climate change on sustainable development in Kogi State reveals that environmental degradation affects educational facilities, leading to overcrowding and inadequate resources for students(Adams & Ohadugha, 2024).

Studying climate risk within Nigerian universities is crucial for several reasons, particularly given the increasing impacts of climate change on education, health, and overall student well-being. Understanding these risks helps institutions develop effective strategies to mitigate adverse effects and prepare future leaders to address climate challenges.

### 2.9.1 Climate risks and its impact on student's performance

The learning environment is significantly impacted by climate change. Extreme weather conditions, such as intense rain and high temperatures, could interrupt academic events. Among other instances, students in Northern Nigeria have complained of difficulties concentrating during lectures due to weather variation, which has a negative impact on their academic performance and general health (Dariya et al., 2021). By studying these risks, universities can implement policies that improve learning environments, such as redesigning academic calendars to avoid peak heat periods or improving classroom infrastructure.

An area of growing interest is the relationship between climate risks and the academic achievement of university students in Kogi State, Nigeria. Among other things, the effects of extreme weather and environmental degradation may have a significant impact on educational results. Studies indicate that high temperatures lead to heat stress, making it difficult for both students and teachers to concentrate, ultimately affecting academic performance (H. C. Robinson et al., 2022).

Kogi State is prone to flooding, which damages educational infrastructure. Disruptions caused by floods not only hinder physical access to schools but also impact the mental

well-being of students. Research shows that such environmental challenges contribute to absenteeism and decreased academic performance due to the loss of instructional time (Anabaraonye et al., 2022).

A systematic review suggests that groups of people living in areas like Kogi State, among whom environmental health hazards particularly impact, including students, have lower academic performance and decreased cognitive capacity. A Study on Factors that Influence Students' Academic Performance in Kogi State University identifies various factors affecting academic performance, including environmental stressors related to climate change (J. Ahmed et al., 2021).

The interaction of academic performance in Kogi State and climate risks calls attention to a serious issue for further research and intervention. Dealing with these challenges demands a multi-faceted approach including better educational facilities, more climate education, and successful adaptation plans. This will enable stakeholders to more effectively help university students navigate the impacts of climate change on their education.

### 2.9.2 Physical risks and its impact on students

University systems including buildings and transportation are among those at threat from climate change. Increased rainfall can cause flooding which destroys buildings and disrupts services. University can ensure continuity in educational services and protect student well-being by means of investing in strong infrastructure that withstand extreme weather events.

Reduced flow rates and network lengths in many big water bodies in Nigeria as well result from lower rainfall and increased evapotranspiration, leading to water scarcity problems on university campuses in Kogi State that affect cleanliness and general student well-being (Alfa et al., 2018).

Under high emission scenarios, Nigeria is projected to experience up to 90 more very hot days per year by 2080 (Okon et al., 2021). Kogi State students could face even more unpleasant learning conditions, higher chances of heatstroke, and maybe elevated energy prices for campus cooling.

### 2.9.3 Health risks and its impact on students

University students in Kogi State, Nigeria, are greatly impacted by the numerous health risks associated with climate change. These risks can jeopardize students' health and academic performance and are brought on by changes in the environment, a rise in the prevalence of diseases, and psychological stressors (Nzeobi et al., 2020).

The health implications of climate change are profound for university students. While flooding raises the prevalence of waterborne illnesses like cholera and typhoid fever, prolonged exposure to extreme temperatures causes heat-related illnesses. Universities can create health education programs and supply essential resources, like cooling centres and hydration stations, to protect students' health during inclement weather by being aware of these risks (Alemayehu et al., 2024).

Climate change influences the life cycle distribution of mosquitoes, which are the vectors of diseases like malaria. Increased temperatures and shifting rainfall patterns may increase the habitats of these vectors, making students more vulnerable to malaria and other vector-borne diseases. A study by (ADOFU & UGWUOKE, 2023) emphasized the importance of environmental factors in significantly contributing to malaria risk in Kogi State, emphasizing the need for awareness and preventive measures among students.

Climate change-related temperature increases can lead to heat-related illnesses, including heat exhaustion and heat stroke. If students do not take appropriate precautions, the Nigerian Meteorological Agency (NiMET) has warned that states like Kogi are at high risk for extreme heat events, which could result in serious health issues (Hussaini & Matazu, 2023).

Changes in precipitation patterns can lead to flooding, which often results in water contamination. This increases the risk of waterborne diseases such as cholera and typhoid fever. University students may be particularly vulnerable during outbreaks, as access to clean water and sanitation facilities may be compromised.

For university students in Kogi State, Nigeria, climate change also poses serious mental health issues. With several studies pointing out the effects on students from environmental stresses and mental well-being, the interaction of these two factors is becoming more widely known. Students' increased levels of anxiety and depression are driven by climate change. Students grow anxious about their future and helpless as severe weather events become more common According to reports, a lot of students worry about how climate change will affect future generations, which adds to the general feeling of gloom and distress (Tochukwu, 2023).

Extreme weather affects academic calendars and makes learning environments unstable. Students who have trouble adjusting to changing conditions experience more anxiety and stress, which adds to their instability. Climate-induced displacement further increases

isolation and suffering by disturbing social networks.

Increased by climate change, factors like resource scarcity and air pollution negatively affects mental well-being. Physical problems resulting from low air quality affect mental well-being in turn.

All the continuous news on climate change magnify perceptions of helplessness and anxiety among students (Goldman, 2023). Exposure to disturbing news on environmental degradation also heightens the sense of urgency and distress, therefore affecting young people's overall mental health.

### 2.9.4 Transition risks and its impacts on students

Transition risks associated with climate change encompass various economic, policy, and legal challenges that can significantly impact university students in Kogi State, Nigeria. These risks manifest in several ways, one of which is the rising costs of transportation, which directly affect students' daily lives and educational experiences (Burke et al., 2020).

As Nigeria and other countries work towards implementing carbon pricing mechanisms to combat climate change, students may face increased costs associated with energy consumption and transportation. Carbon taxes have the potential to affect students' budgets and financial stability by raising utility bills and transportation fares, (Dodman et al., 2022).

Transportation costs have significantly increased in Nigeria as a result of the removal of fuel subsidies. Reports indicate that public transport fares have increased, with students now paying significantly more for their daily commutes. The cost of a shuttle bus, for instance, has increased from ₦200 to ₦300, while longer trips have seen increases from ₦500 to ₦1,500 (Titus et al., 2024). While this aligns with global efforts to reduce greenhouse gas emissions and promote environmental sustainability it has increased transportation costs, placing additional financial burdens on students who already have little. Students may reduce their participation in classes and other necessary activities as a result of rising transportation expenses.

### 2.9.5 Market risks and its impact on students

Market risks associated with climate change significantly impact university students in Kogi State, particularly through shifts in supply and demand for goods and services. These

changes affect transportation systems, food availability, and overall living costs, which are crucial for students' daily lives and academic performance (Chete & Chete, 2021).

Climate change impacts agricultural productivity, which can lead to fluctuations in food supply and prices (Muluneh, 2021). Students face higher food costs due to reduced crop yields caused by erratic weather patterns. This situation can strain their budgets as they attempt to manage rising living expenses while pursuing their education. Reports indicate that as transportation costs rise, the prices of goods—including food—also increase due to higher logistical expenses for vendors. Consequently, students may need to adjust their spending habits or rely on less nutritious food options (Ikuemonisan & Akinbola, 2019).

The economic pressure from rising transportation costs and food prices has led to decreased patronage of local businesses by students. Many students are forced to prioritize essential expenses over discretionary spending, negatively impacting small businesses that rely on student customers (Naz et al., 2020). Also, with the rising cost of transportation affecting food delivery logistics, students have noted that the price of basic groceries has increased forcing them to adjust their diets and spending habits (Ma et al., 2023)a.

Small businesses near campuses also seem to be affected, there is a significant decline in sales as students prioritize essential expenses over-eating out or purchasing non-essential items due to increased living costs.

It is recommended that HEIs be proactive in mitigating climate risks (Leal Filho et al., 2024). To ensure that all graduates understand the scientific foundations of climate change and its societal implications, this involves creating curricula that integrate climate education across multiple disciplines. Institutions are encouraged to create environments that promote resilience against climate impacts, such as extreme weather events, which can affect campus operations and student well-being (Dzvimbo et al., 2022).

### 2.10 Theoretical framework

Various researchers have commented on the need for a reasonable level of public scientific literacy as a necessity of an equitable society (Bybee, 2018)(Queiruga-Dios et al., 2020)(Valladares, 2021). The rationale for this argument is that the general public can then become “good citizens” who are in a position to make informed and more accurate decisions about scientific issues (Özden, 2020).

Environmental issues of the early twenty-first century are characterized by a high level of scientific, technical, environmental, and political complexity (Cameron, 2011)(Salehi et al., 2016) (Marks, 2024). This thinking gives the rationale for research on public perception of global climate change (public knowledge and concern), which is considered to be of supportive or hindering character for public action on climate change (Yousefpour et al., 2020)(Ruiz et al., 2020).

Public perception of global climate change has been researched since two decades, whereby major emphasis was put on North America and Europe and less on developing countries (Capstick et al., 2015) (Dechezleprêtre et al., 2022) (Bush & Clayton, 2023). And it shows that public knowledge of global climate change is relatively moderate and that for a majority of the people it is rather difficult to understand the scientific context behind the term global climate change (Lewandowsky, 2021) (Bush & Clayton, 2023).

With regard to public concern about global climate change, studies show relatively high concerns, which are expressed in thoughts about negative impacts or events (e.g. catastrophes) resulting from global climate change (Chen et al., 2020) (Hickman et al., 2021) (Dechezleprêtre et al., 2022) . In the context of public action on global climate change, it is necessary to provide locally contextualized procedural knowledge to the public so that it can apply its concerns and knowledge into action (Fünfgeld & Schmid, 2020) (Yuille et al., 2021) (Nussey et al., 2022).

The aim of this study is to discover the university students' level of awareness and perception of global climate change based on the demographic factors such as age, gender, or field of study.

# CHAPTER THREE

# METHODOLOGY

## 3.1 Study Area

The study was conducted in Kogi State. Of the 36 states of Nigeria, Kogi is the thirteenth largest in the area and twentieth most populous with an estimated population of about 4.5 million as of 2022 (Ifatimehin et al., 2021). It has twenty – one (21) local government areas, each overseen by a chairman.

Kogi state is extremely susceptible to environmental challenges. This is because it is located at the confluence of the Niger and Benue rivers and thus frequently experiences flooding which seriously disrupts infrastructure and education. Furthermore, ecological crises are made worse by the state's vulnerability to gully erosion, making this area a compelling focus for this study.

### 3.1.1 Geographical location and climate

Kogi State is geographically located between latitude 7° 45' 0 N and longitude 6° 45' 0 E and it has a landmass of 29,833 square kilometres (Ifatimehin et al., 2021) . The region has two distinct seasons: a dry season and a wet season (Ifatimehin et al., 2021). Economically, the strategic central location of the city and its location at the confluence region of the two great rivers Niger and Benue attracted many ethnic groups and individuals. Economic activities such as agriculture, spinning, weaving, blacksmithing, pottery, dyeing, fishing, etc are carried out by the various ethnic groups, with agriculture being the main occupation of the people, which makes them more vulnerable to climate change (Buba et al., 2021). The educational system in Kogi State includes the primary, secondary, and tertiary institutions. The distribution of educational facilities encompasses the various senatorial districts in the state.

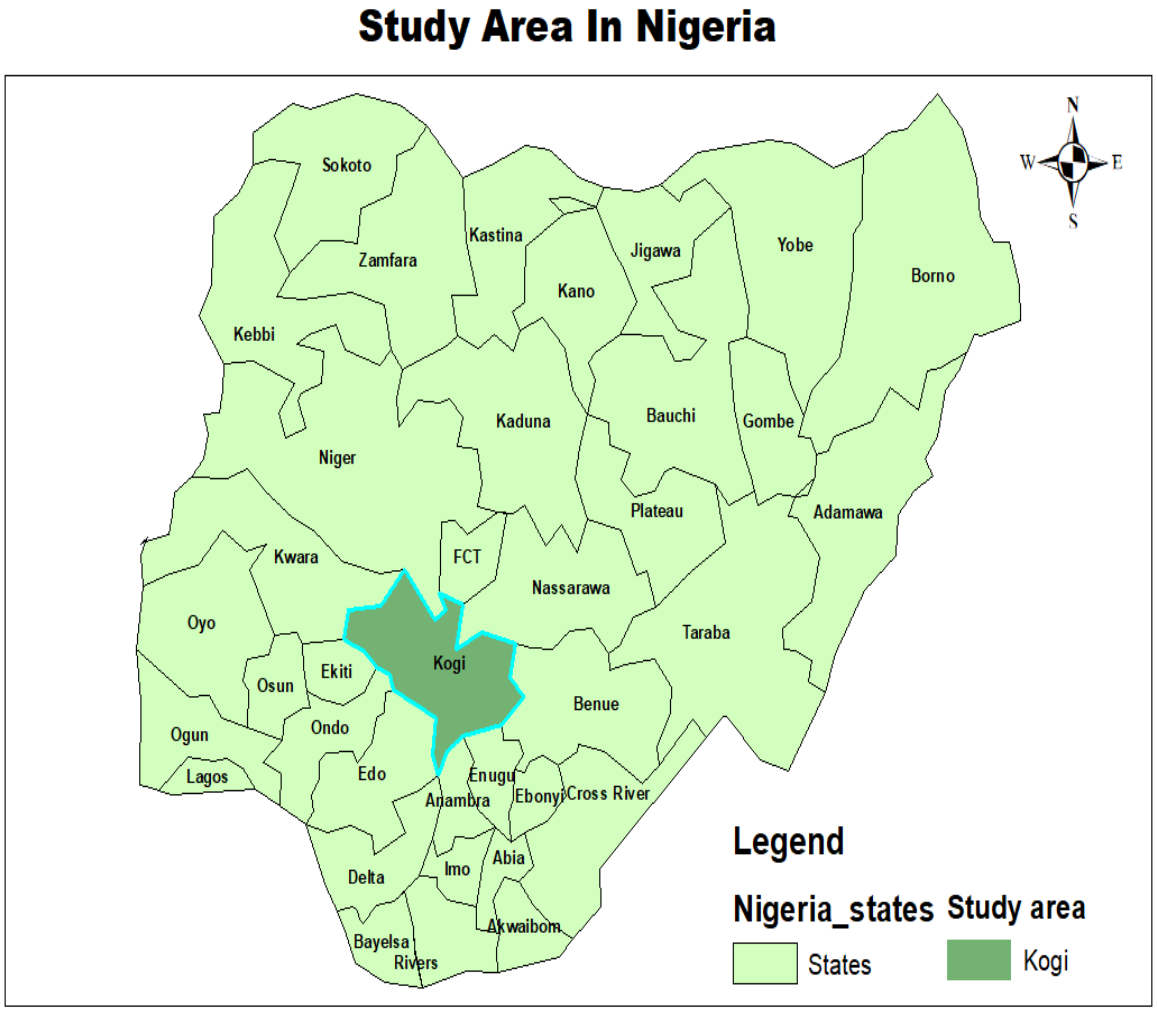


**Figure 3.1: Map of Nigeria showing the study area**

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**Figure 3.2: Map showing the selected universities in the study area**

### 3.1.2 Target Population

The study focused on students in tertiary institutions in Kogi State, Nigeria, which has a population of 4.5 million as of 2022 (Ifatimehin et al., 2021). This will form the respondents for this study. The study targeted three tertiary institutions, which are the Federal University Lokoja, Prince Abubakar Audu University, and Salem University respectively. These universities were chosen because they host a major population of students in tertiary institutions in Kogi State. These institutions have an estimated total number of 9000, 30,000, and 3000 students respectively (UniRank 2024).

It is assumed that the students in these universities lack comprehensive information and education regarding climate change. This is because it is not integrated into their education system even though they are affected by the impact of climate change.

## 3.2 Research design

A well-organized questionnaire titled "What do you think about climate change?" was developed for collecting data from the students. This is in line with UNEP's observation that

questionnaire survey can be used to gauge the opinions, capabilities and level of awareness of key stakeholders on climate change (Canton, 2021).

The questionnaire scheduled was randomly administrated to ensure that every student had an equal chance of been selected. The data collected from the questionnaire was through field survey as well as online questionnaire filling.

The research objectives and key concepts were explained to students gathered in the classroom, and questionnaires were then distributed to them to fill it in the class. Students were instructed as to how to fill in the questionnaire and given the opportunity to ask questions. They were also informed about the privacy and confidentiality of any information they would give. Participation was voluntary, and consent was obtained before distributing the survey questionnaire.

The data collected were coded and then analysed using the R Software version 4.4.2. Firstly, the data were descriptively analysed to show a summary of data, such as frequencies, percentages. Then formulated into bar charts, pie charts and word cloud.

Also, the focus group and key informant interview method was selected to analyze interrelations between students and staffs' opinions on a set of guiding questions related to the objectives of the study. Participants in the focus groups were selected randomly, taking into account different groups of the population that included lecturers, Head of Department, Laboratory Technologist, and students.

Finally, the World Wide Web was used to download essential reports and articles on the topic. The websites of various non-governmental organizations, both regional and international, were visited to obtain background to the issue. This made up for the secondary source of information.

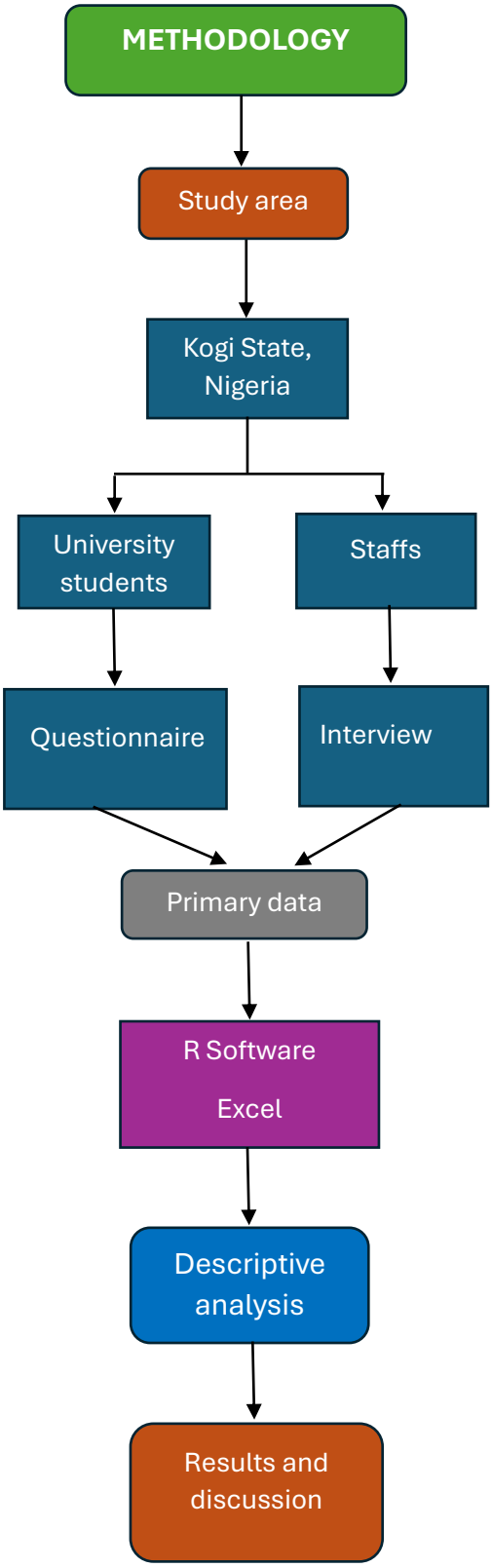



**Figure 3.3: Flowchart of Research Methodology**

### 3.3 Sampling procedure and sampling size

The study was carried out in three universities in Kogi State. It is assumed that the students in these universities lack comprehensive information and education regarding climate change. This is because it is not integrated into their education system even though they are affected by the impact of climate change. University students were chosen based on their likely influence on current and future climate adaptation activities in Nigeria. A random sample strategy was used to gather comprehensive data on students' perception on the issue of change in these institutions. The formula by Cochran (1977) shown below was used to estimate the sample size:

$$n = \frac{Z^2 \times P \times (1 - P)}{d^2}$$

Where n = sample size

Z = normal curve distribution (1.96 which corresponds to 95% confidence interval)

p = proportion of university students in Kogi State, and

d = margin of error set at 95% (given as 0.05).

After inputting the required values into the formula, it yielded a total sample size of about 271 university students.

**Table 3.1: Sample size of study**

| Name of University | Sample Size |
|---|---|
| Federal University Lokoja | 58 |
| Prince Abubakar Audu University | 194 |
| Salem University | 19 |
| **Total** | **271** |

To ensure equal inclusion in the study, the sample sizes for each university were determined based on their respective student populations. Since the total sample size was set at 271 students, the sample was distributed among the three universities using a proportional allocation method. The number of respondents sampled from each university represented

their relative size because each has a different total student population. To do this, the sample size for each university was calculated using this formula;

Sample Size for each university = $(Population\ of\ the\ university\ /Total\ Population) \times$ Total Sample Size

The estimated total number of students in each university was used, ensuring that larger universities contributed more respondents while smaller universities had proportionally fewer respondents. Based on estimated student populations, Federal University Lokoja with 9,000 students, contributed 58 respondents, Prince Abubakar Audu University with 30,000 students, contributed 196 respondents and Salem University with 3,000 students contributed 19 respondents.

Once the sample size for each university was determined, students were chosen at random to prevent bias and endure fairness. Questionnaires were distributed via student groups on social media and academic platforms to reach a larger pool of respondents. Students were also approached in various faculties and departments to ensure diverse academic backgrounds were included. Also, they were additionally selected from open spaces like university walkways to capture a broader perspective.

This made it possible that students from different institutional backgrounds were adequately represented and that the findings were not biased toward any university.

### 3.4 Data collection

#### 3.4.1 Questionnaires

Data was collected using a well-organized pre-tested and validated online questionnaire developed by the researcher and physically. This was created using a google form and sent to the university students via their social media pages or cell phone numbers. It was administered to students from the science and non-science faculties and departments. It was sent through their respective class representatives and in person in some departments. The structured questionnaire was divided into five sections, the first section includes the demographics, the second focused on questions relating to students' awareness and understanding of climate change, the third on students' attitudes and perceptions of climate change impacts on their local environment, the fourth on students' perception and preparedness for climate risks and the fifth section on the role of their universities in climate change education.

For this study, the total number of respondents was 271. The number of respondents for the various universities chosen for this study were 56 for Federal University Lokoja, 196 for Prince Abubakar Audu University and 19 for Salem University respectively.

### 3.4.2 Focus Group Discussions (FGD):

Three focus group discussions were held, one in each university. Groups were made up of both female and make from different course of study and age group. This sought to analyse the participant's awareness and perceptions about climate change, its causes, effects and adaptation practices. It lasted for about 10 minutes. This discussion was moderated by the researcher.

### 3.4.3 Key Informant Interviews:

A total of eight interviews were conducted in this study. Three from Federal University Lokoja and Salem University and two from Prince Abubakar Audu University. These informants included the Heads of Departments, Lecturers, and Laboratory Technologists from the three selected universities. These interviews were structured to elicit information on their perception about climate change, its impact and the role of their university in climate change education. The Key informants all had spent at least several years in their respective universities.

### 3.4.4 Data Analysis

The acquired data were systematically arranged and encoded, considering the important variables entered into the R Software. Two software applications, R Software, and Microsoft Excel were utilized. The results were analysed using descriptive statistics such as frequency distribution and percentage which were presented in tables, bar charts, pie charts and word cloud.

## 3.5 Ethical consideration

The researcher asked for permission from the university committee. A brief was done and explanations for the respondents to understand what was expected of them. Participation in the assessment was optional, and participants could opt out of the evaluation without charge. Research was solely intended for educational purposes. No unique identity details were obtained from the respondents. Names of respondents involved in the studies was kept confidential.

# CHAPTER FOUR

# RESULTS AND DISCUSSION

## 4.0 Introduction

This chapter comprises findings and interpretation of the data analysis gathered in this study. The results are presented in the form of tables showing frequencies and percentages. The data analyzed are divided into topics that reflect the research objectives. The study also sought to explore and understand the perceptions of global climate change of university students in Kogi State.

A total of 271 questionnaires, 8 interviews and focal group discussions were conducted. Of these, 56 questionnaires were distributed to students at Federal University Lokoja, 196 to students at Prince Abubakar Audu University, and 19 to students at Salem University. In addition, interviews were conducted with 8 employees of the three universities. The researcher made the questionnaires available both online and through face-to-face visits to the respective universities, which resulted in a response rate of 100%.

## 4.1 Demographic information

Demographic information of the respondents is important in describing the characteristics of the participants in this study. Respondents' gender, age, marital status, university, course of study, and current level of study were sought. This contributed significantly to this study.

**Table 4.1 Socio-economic characteristics of the respondents**

| | | Frequency | Percent |
|---|---|---|---|
| Gender | Male | 146 | 53.9 |
| | Female | 125 | 46.1 |
| Age | <18 | 18 | 6.6 |
| | 18-22 | 150 | 55.4 |
| | 23-27 | 79 | 29.2 |
| | 28-32 | 12 | 4.4 |
| | >32 | 12 | 4.4 |
| Marital Status | Single | 256 | 94.5 |
| | Married | 15 | 5.5 |
| University | Prince Abubakar Audu University | 198 | 71.6 |
| | Federal University Lokoja | 58 | 21.4 |
| | Salem University | 19 | 7 |
| Level of study | Undergraduate | 247 | 91.1 |
| | Postgraduate | 24 | 8.9 |

**Source : Respondents response to questionnaire/ survey**

Table 4.1 provides the demographic information gathered; 53.9% of participants identified as male, whereas 46.1% identified as female. These findings suggest that the composition of this research is slightly more male than female. The respondents have a higher percentage of the "18-22" years age bracket (55.4 %), 29.2% have the "23-27" years age bracket, and the other age ranges make up less than 5%. More than half of the respondents (94.5%) were single, and the others married. The respondents cut across three universities with 71.6% from Prince Abubakar Audu University, 21.4% from Federal University Lokoja and 7% from Salem University. Among the respondents, 91.1% were undergraduates and 8.9% were postgraduates. More than half of the respondents (94.5%) were single and 15% married. The respondents cut across three universities with 71.6% from Prince Abubakar Audu University, 21.4% from Federal University Lokoja and 7% from Salem University.


### 4.2 Awareness of climate change

#### 4.2.1 Awareness based on gender

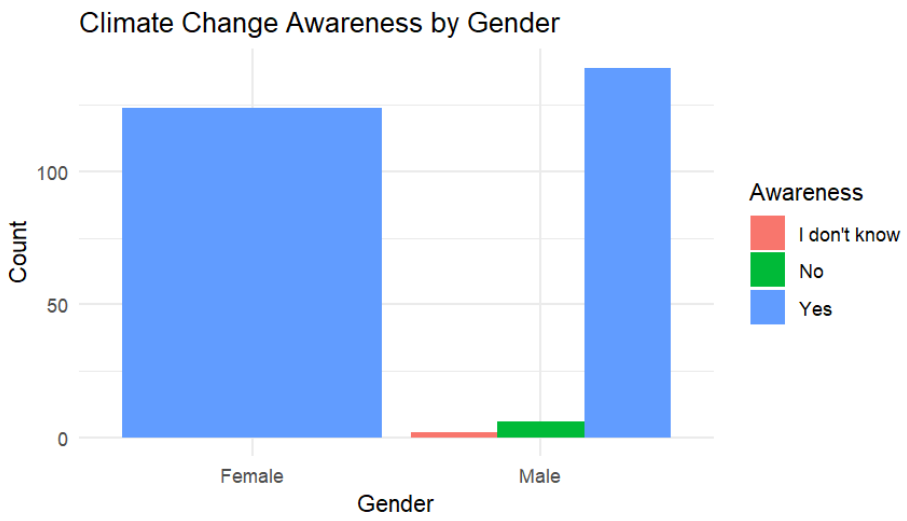



**Figure 4.1: Climate change awareness by gender**

According to the findings shown in figure 4.1, most male and female participants are aware of climate change. 100% of the female participants are aware of climate change, 94.56% of the male participants accepted that they are aware, and a small number said they either lack awareness of climate change or totally oblivious of it.

This finding shows that among students, irrespective of their gender, awareness of climate change is quite strong. One could relate the small differences seen to variations in engagement with environmental problems, personal interests, or level of academic exposure.

Higher levels of awareness among both genders show that discussions and education on climate change are infiltrated into social and academic discourse.

### 4.2.2 Awareness based on university

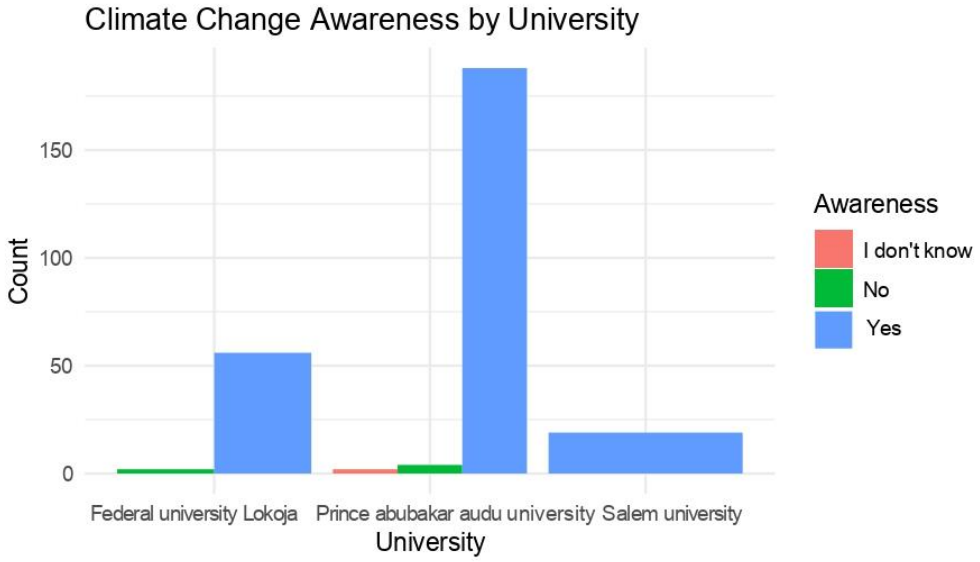



**Figure 4.2: Climate change awareness by university**

The study's various universities' varying levels of climate change awareness are shown in Figure 4.2. 96.55% of students at Federal University Lokoja are aware of climate change, according to the findings, while 3.45% are not. Students at Prince Abubakar Audu University reported that 96.91% of them knew about climate change, 2.03% did not, and 1.06% had never heard of it at all. Lastly, Salem University noted that all respondents had a 100% awareness of climate change. The curriculum's content, emphasis on environmental studies, extracurricular activities, and institutional policies on climate change education can all be linked to the differences in awareness levels among universities. Higher levels of awareness among students are a result of institutions with strong sustainability programs or environmental advocacy initiatives.

These results show that, although awareness of climate change is generally high, there are differences among the various institutions. This indicates that in order to close the knowledge gaps and guarantee that every student has a sufficient understanding of climate change issues, targeted educational interventions and awareness campaigns are required.

### 4.2.3 Awareness based on course of study


**Figure 4.3: Climate change awareness by course of study**

A strong representation of students from the fields of Law, Political Science, Geology and Nursing is evident in Figure 4.3, which displays the respondents' course of study. The results show that 93.55% of law department students are aware of climate change. 96% of students in the Political Science department are aware of climate change. Additionally, it shows that while 20% of industrial chemistry students are ignorant of climate change, 80% are. 100% of students in Geology, Nursing, Mathematics and Medicine and surgery are aware of climate change. This shows that students from the humanities and social sciences are very much involved. The fact that these fields are aware of climate change, indicates that environmental and science-based fields are not the only ones with interest in or awareness of climate change. This casts doubt on the notion that students majoring in environmental science, geography, biology, or engineering are the only ones who are aware of climate change. Rather, it emphasizes that students studying social sciences, and law are having discussions about climate change. The increasing understanding that climate change is not only a scientific problem but also a policy, economic, media, and social justice issue is reflected in this change. It also suggests that interdisciplinary methods of teaching about climate change are necessary.

This finding shows how important it is to integrate climate change education across all disciplines. This is to ensure that students in social sciences understand both the scientific

and socio-economic aspects of climate change. To close the gap and advance a more comprehensive approach to climate education, universities should think about growing their sustainability programs, multidisciplinary courses, and electives with a climate focus.

### 4.3 Primary source of information

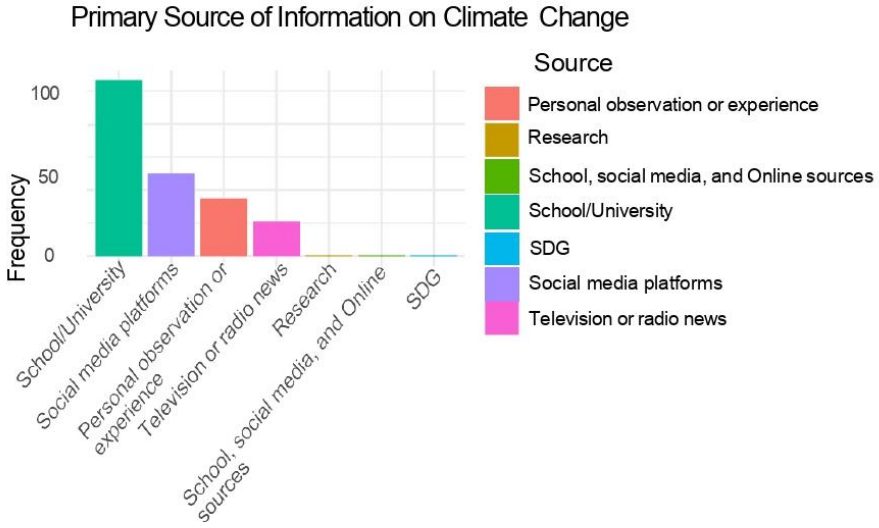



**Figure 4.4: Primary source of information**

The respondents' primary sources of information about climate change are shown in Figure 4.4. The findings show that almost half of the participants (49.45%) learned about climate change from their school/university. This indicates that, according to this study, formal education is the most important source of knowledge about climate change. This research shows how important educational institutions are in influencing students' knowledge and comprehension of environmental issues. Given that formal education is a highly regarded primary source, incorporating conversations about climate change into a variety of academic fields is likely to improve students' understanding and involvement with sustainability issues. No matter their educational background, respondents' awareness and knowledge have been successfully demonstrated to increase with formal education; this study's results, which showed a high percentage of respondents' awareness on climate change.

Our results are in line with those of earlier studies that emphasized the impact of formal education on increasing awareness among secondary school students (Abd Hamid et al., 2021).With 23.25% of responses, social media platforms rank as the second most popular information source. This illustrates how social media platforms like Facebook, Instagram, TikTok, and Twitter are increasingly used to spread content about climate change. Social

media is an essential tool for climate advocacy and education because it makes information sharing rapid and widely accessible. But the dependence on social media also brings up issues with false information and unsubstantiated claims. Accessibility of information to all has been made possible through social media, but in order to be sure students are exposed to accurate and scientifically supported climate knowledge, it is important to encourage critical thinking and reliable sources.

The third most frequently cited source was personal observation and experience, with 16.24% of responses. This suggests that a considerable number of students assess their awareness level of climate change based on personal encounters with extreme weather, rising temperatures, flooding, and droughts. The exposure of their environment to the direct effects of climate change has increased their awareness and concern for the problem. This study emphasizes the importance of explaining climate science in a way that connects global debates to local realities so that people can relate abstract ideas about the climate to real-world changes.

Of the respondents, 9.96% cited traditional media sources, such as radio and television news. Although these sources have been known to play a major role in shaping the opinion of the public, their influence have been sidelined by the emergence of digital platforms. This drastic change is as a result of the high level of media consumption, especially amongst the younger population who prefer online content over conventional news broadcasts.

Just 0.37% of respondents reported that their main sources of information about climate change were research and SDG initiatives. Although scholarly research and programs with a sustainability focus offer trustworthy and comprehensive insights into climate issues, their limited student reach points to a gap in accessibility and engagement. This might be because scientific reports are often technical and complex, making them difficult for the general public to understand. Simplifying research findings, incorporating SDG discussions into academic programs, and urging students to read evidence-based climate literature are all ways to try to close this gap.

Overall, the results emphasize both the growing significance of social media and individual experiences as well as the dominance of formal education in raising climate awareness. Students can gain a comprehensive, fact-based understanding of climate change by increasing access to research-driven climate information, encouraging responsible social media use, and strengthening university-based climate education.

## 4.4 Understanding the effects of climate change

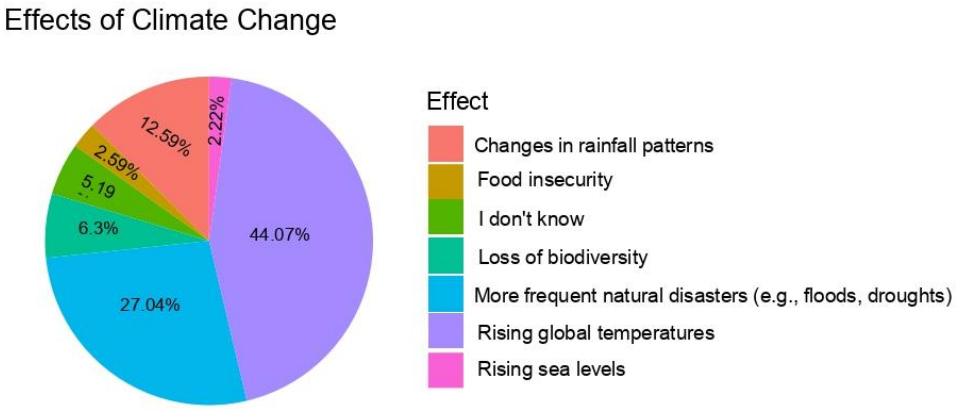



**Figure 4.5: Effects of climate change**

Students' responses on the impact of climate change are shown in Figure 4.5. It shows that the greatest effect of climate change is the increase in global temperatures (44.07%). This is in line with research by (Munguia et al., 2023), which found that the majority of students in the study identified global warming as a pressing environmental issue. In a similar vein, a study conducted by (Malgwi & Joshua, 2021) on climate change awareness among students in north-east Nigerian tertiary education revealed that rising temperatures were acknowledged as a significant consequence of climate change, with 46% of respondents seeing heatwaves as occurring more frequently.

The increased frequency of natural disasters (27.04%) is the study's second most well-known effect. According to a study by (Azare, Dantata, et al., 2020), floods and droughts are frequent, especially in places like Nigeria where rainfall patterns are more variable. This is further supported by the fact that 20.5% of the respondents in his study mentioned flooding as a major concern (Malgwi & Joshua, 2021). Other significant effects mentioned by the respondents were changes in rainfall patterns (12.59%), biodiversity loss (6.3%), and food insecurity (5.19%). Just 2.59% of those surveyed said they were unsure about how climate change would affect them. This suggests that places that are directly affected by climate change may have greater awareness.

### 4.4.1 Understanding the contributing factor to climate change

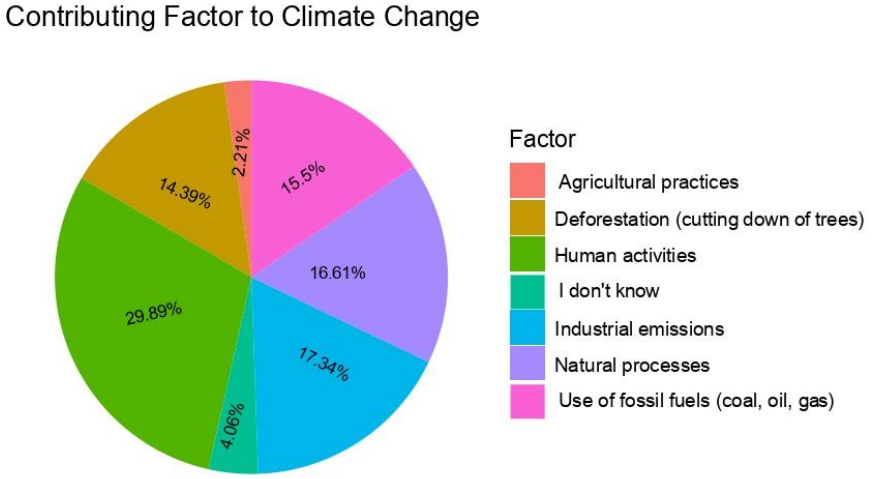



**Figure 4.6: Contributing factor to climate change**

The survey results received a lot of objective answers about the contributing factor to climate change. Specifically, about 29.89% respondents believe that human activities are the main contributors to climate change. A study by (Filonchyk et al., 2024) also emphasizes on how human activity enhances greenhouse gas effect.

Also, 17.34% and 15.5% of respondents believe that industrial emissions and fossil fuel consumption are major contributors to climate change respectively. These results align with a study from (Gołasa et al., 2021), which attributes fossil fuel as a significant source of greenhouse gas emission. Similar studies in African contexts, such as (Afriyie et al., 2023) found that industrialization is also a major source of greenhouse gas emission.

About 14.39% cited deforestation as a contributing factor to climate change. In Nigeria, deforestation is a well-documented issue due to logging, agricultural expansion, and urbanization (Olowoyeye, 2021). The 14.39% recognised agricultural practices as a contributing factor while only 4.06% of respondents were unsure about the contributing factors. This suggests that respondents in this study understands the human-driven causes of climate change.

### 4.4.2 Understanding the threat significance of climate change

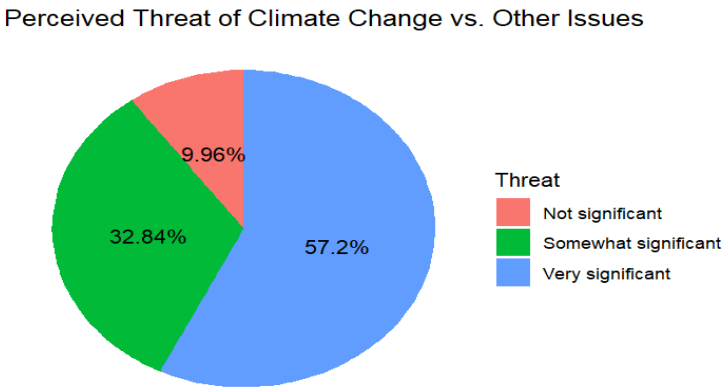



**Figure 4.7: Perceived threat of climate change vs other issues**

The perception of climate change as a serious threat is strongly reflected in figure 4.7, with 57.2% of respondents considering it "very significant" and 32.84% considering it "somewhat significant". These results are in line with (Wullenkord et al., 2021) who confirmed that climate change is an existential threat.

The 9.96% of respondents who reported climate change as "not significant" shows that some people either minimize or do not fully understand how urgent the problem is. This may be due to difference in socioeconomic concerns, a lack of firsthand experience with extreme climate events, or misinformation.

### 4.5 Climate change as a risk in the community

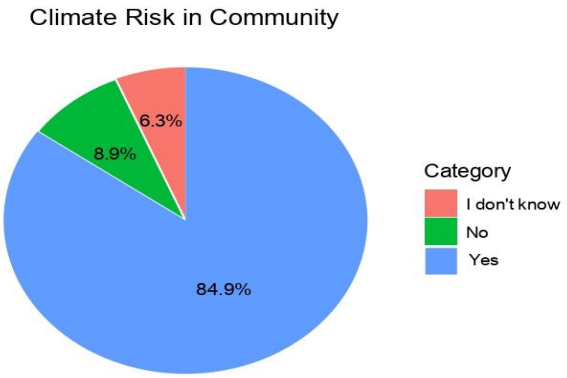



**Figure 4.8: Climate change as a risk in the community**

Quite a number of respondents (84.9%) believe that climate change constitutes a risk in their community, based on the responses shown in Figure 4.8. It implies a high degree of

awareness and understanding of climate change as an urgent problem that affect their surroundings. This is also confirmed by studies like (Yazar et al., 2022), which found that most people perceive climate change as a serious threat, especially in areas where its effects are more prominent.

The 8.9% of respondents who stated "no" points to a minority that is either sceptical of climate change or does not see any immediate climate risks in their community.

(Leka & Furnham, 2024) also conducted a research which is in line with this. In his study, he suggested that scepticism about climate change may be as a result of personal, political, or ideological views in addition to a lack of personal experience of the terrible consequences of climate change. People sometimes mistakenly believe that natural variability, not human-caused climate change, is to blame for environmental changes.

The 6.3% respondents who indicated "I don’t know," implies a degree of uncertainty or ignorance about the local effects of climate change. This implies that focused education and awareness campaigns are necessary to increase knowledge, especially in areas where communities might not have had access to information on climate change. According to research by (Yeh et al., 2024), increasing knowledge about climate change can greatly improve people's perception of climate risks and promote active adaptation measures.

### 4.5.1 Impact of climate risks on students and their environment

**Table 4.2 Questions on climate risk and its impact on students and their environment**

| Questions | | Frequency | | Percentage | |
|---|---|---|---|---|---|
| | | Yes | No | Yes | No |
| Q1 | Have you or your family experienced damage to your home or property due to extreme weather events e.g. floods or storms? | 122 | 149 | 55.0 | 45.0 |
| Q2 | Have you had to pay more for transportation because of problems caused by bad weather e.g. damaged roads? | 227 | 44 | 83.8 | 16.2 |
| Q3 | Has transportation to school been delayed or cancelled due to weather problems like flooded roads or extreme heat? | 188 | 83 | 67.5 | 32.5 |
| Q4 | Are there alternative transportation options available to you when regular routes are disrupted by flooding or road damage? | 130 | 141 | 48.0 | 52.0 |
| Q5 | In the past year have you or someone you know suffered from a health condition related to extreme weather e.g. waterborne diseases respiratory issues from poor air quality? | 173 | 98 | 63.8 | 36.2 |
| Q6 | Have extreme weather events caused an increase in your expenses e.g. higher transportation costs due to road damages, increased electricity bills for cooling or heating, increase in prices of food water or other important items? | 239 | 32 | 88.2 | 11.8 |
| Q7 | Has your school or classroom been damaged by weather events like storms or floods? | 103 | 168 | 38.0 | 62.0 |
| Q8 | Have your classes or exams ever been cancelled because of bad weather like heavy rain or flooding? | 147 | 124 | 54.2 | 45.8 |
| Q9 | Has bad weather ever made it hard for you to get to school e.g. roads blocked by floods or heavy rain? | 194 | 77 | 71.6 | 28.4 |
| Q10 | Have extreme temperatures heatwaves or cold spells affected your ability to concentrate or perform well in your studies? | 194 | 77 | 71.6 | 28.4 |

**Source : Respondents response to questionnaire/ survey**

Table 4.2 provides information on a full understanding of how climate risks impact students and their immediate surroundings. Examining the answers to each question provides important information about the difficulties that students face as a result of extreme weather.

For Q1, the slight majority of respondents (55.0%) stated that extreme weather events like floods or storms have caused damage to their homes or property affecting them or their families. The vulnerability of residential areas to climate hazards is evident in this finding, which affects different communities in Nigeria.

Regarding Q2, a significant portion of students (83.8%) reported that they had to pay more for transportation due to weather-related problems like damaged roads. This response draws attention to the financial strain that students face because poor infrastructure raises the cost of transportation.

Regarding Q3, about 67.5% of participants reported that weather-related issues, such as flooded roads or excessive heat, had caused delays or cancellations in their school transportation. This statistic indicates how climate variability directly affects students' access to education, as environmental factors make it difficult for them to get to school.

For Q4, when regular routes are interrupted by flooding or road damage, almost half of the respondents (48.0%) stated that there are alternate modes of transportation available. This suggests that even though some students have access to this, a sizable percentage do not have any trustworthy alternatives, which could make it more difficult for them to continue their education in the event of bad weather.

For Q5, above half of the respondents (63.8%) of admitted that they or someone they know has suffered from health conditions related to extreme weather, such as waterborne diseases or respiratory issues from poor air quality. And this indicate that climate change increases health risks.

For Q6, 88.2% of respondents noted that extreme weather events have led to increased expenses, including elevated electricity bills for cooling or heating, and rising prices of essential items like food and water. This statistic reflects the broader economic implications of climate change, where individuals bear additional financial burdens due to environmental disruptions.

Just 38.0% of students in Q7 said that weather-related incidents like floods or storms had destroyed their school or classroom. Even though this percentage is smaller than other

effects, it nevertheless shows that a sizable amount of educational infrastructure is vulnerable to climate hazards, which can have an impact on the learning environment.

Just half (54.2%) of the respondents to Q8 reported that bad weather, like intense rain or flooding, had caused them to miss classes or exams. Academic progress is hindered by this disruption, which also emphasizes the necessity of flexible teaching methods to reduce the effects of climate change.

In Q9, 71.6% of students reported having trouble getting to school because of weather conditions, such as roads that were closed because of flooding or heavy rainfall. This high percentage stresses how important it is to have resilient infrastructure and how better planning is needed to ensure access to education even in the face of climate change.

In response to Q10, 71.6% of respondents indicated that extreme weather conditions, like heat waves or cold spells, have impacted their capacity to focus or do well in school. This emphasizes the significance of creating conducive learning environments with evidence that temperature extremes can affect cognitive processes and academic performance.

### 4.6 Local government action towards climate change

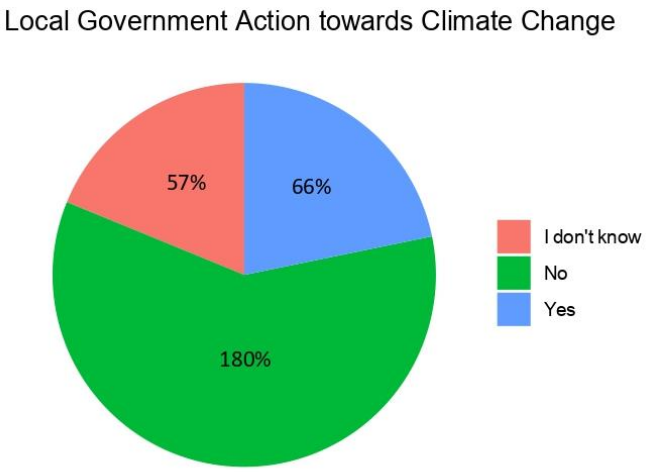



**Figure 4.9: Local government action towards climate change**

The findings from figure 4.9 shows that a great percentage of respondents believe that the local government is not taking adequate steps to address climate change. This sentiment aligns with studies conducted where local governments often face financial and infrastructural limitations in implementing climate policies (Sibiya et al., 2023). Many respondents also expressed uncertainty about governmental actions, suggesting either a lack of communication about climate initiatives or minimal visible intervention. This finding

shows the need for increased government transparency and community engagement in climate resilience strategies.

### 4.7 Personal action towards mitigating the local impact of climate change

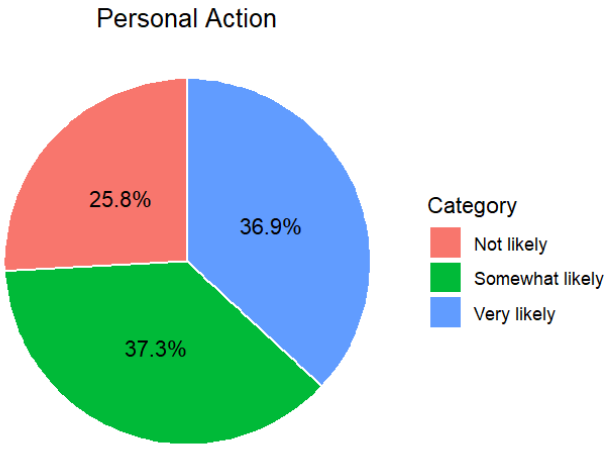
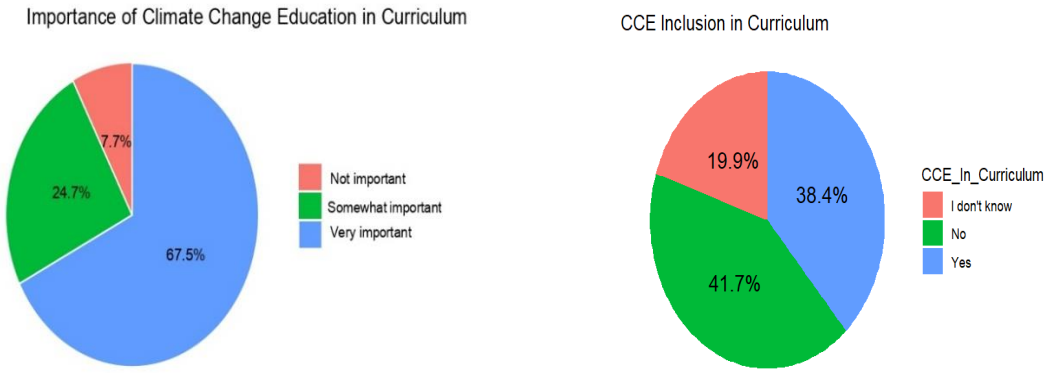



**Figure 4.10: Personal action towards mitigating the local impact of climate change**

The findings indicates that a significant percentage of respondents are either somewhat likely or very likely to take personal action. And this is consistent with findings from studies in other developing contexts, which emphasize that public willingness to engage in climate mitigation efforts often depends on their level of awarenss of climate change and its risks (Khatibi et al., 2021). This implies that people are aware of their responsibility to address climate issues locally, even though government action is seen as insufficient. Respondents' readiness to take personal responsibility raises the possibility of community-led adaptation strategies that local governments could use to improve the effectiveness of these policies.

## 4.8 Climate Change Education in Curriculum




(a) (b)

**Figure 4.11: (a) Importance of climate change education in curriculum (b) Climate Change Education inclusion in curriculum**

The responses presented in Figure 4.11a reveal that a significant majority (67.5%) of respondents believe that climate change education in the university's curriculum is very important. 24.7% of respondents consider it to be somewhat important and 7.7% consider it not important. This statistic shows a widespread recognition of the critical role education plays in addressing climate challenges. And it aligns with the findings of (Kolenatý et al., 2022) that knowledge is a key initial driver for climate action.

Figure 4.11b investigates the inclusion of climate change education in the curriculum of these universities. A greater percentage of the respondents (41.7%) admitted that this is not included in their curriculum. While 38.4% of respondents admitted its inclusion, 9.9% were uncertain. This suggests that, in these universities, climate change education is either not widely integrated or lacks sufficient visibility. This implies that climate change education is either not well-integrated or not sufficiently visible in these universities. This observation aligns with global trends. According to a comparative curriculum analysis, school curricula around the world largely ignore the significant amount of research that makes up climate change (Dawson et al., 2021). In order to better prepare students for upcoming environmental challenges, these findings indicate the necessity of universities to better integrate and prioritize climate change education within their curricula.

### 4.9 Climate change education in university

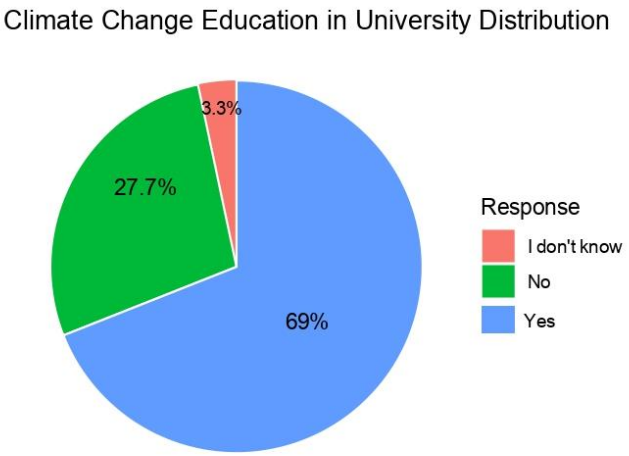



**Figure 4.12: Climate change education in university**

Figure 4.12 indicates that 69% of university students have received information about climate change during their studies, while 27.7% have not, and 3.3% are uncertain. This suggests that while a majority are informed, a significant portion remains uninformed.

Comparatively, several universities have taken proactive steps to enhance climate education. For instance, The University of San Diego (USCD) with aid from the University of California (UC) has made effort into incorporating climate change education into existing courses. They added a climate change studies minor under the Scripps Institute of Oceanography (SIO). This provides an opportunity for undergraduate students to receive credit and recognition for learning more extensively about climate change throughout their undergraduate education.

The several courses' elections under the minor also show how many classes on climate and sustainability are available at UCSD. "Bending the Curve" is also a great illustration of an interdisciplinary course offering that distinguishes the UC system from other institutions in the field of climatic education (Al-Ateeq et al., 2020).

This emphasizes how important universities are in providing students with the knowledge and abilities needed to address climate change effectively. This supports the requirement of further complete incorporation of climate education to ensure all students are well informed about environmental issues.

### 4.10 Influence of university on student's awareness on climate change

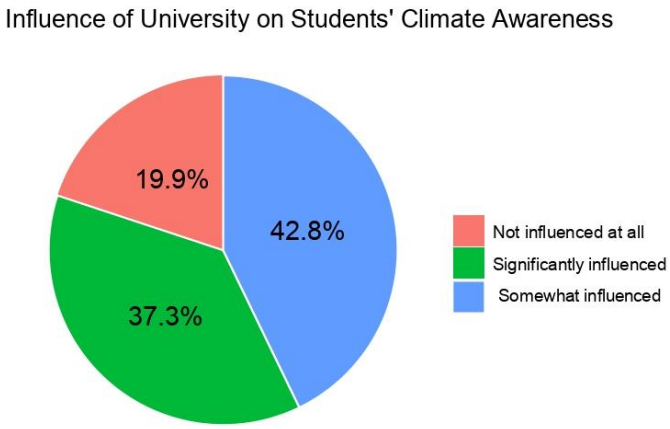



**Figure 4.13: Influence of university on students' climate change awareness**

The survey results indicate that 42.8% of respondents felt "somewhat influenced," 37.3% felt "significantly influenced," and 19.9% felt "not influenced at all" by their university regarding climate change awareness. This suggests that while a majority of students acknowledge some level of influence from their university, there remains a notable portion who perceive minimal or no impact. These findings align with previous studies highlighting the varying effectiveness of university-led sustainability initiatives on students. For instance, in a study carried out in three universities in Sweden conducted by (Ulkhaq & George Joseph, 2024) , the result shows that there is significant difference regarding students' attitudes at these three universities in general. And one of the reasons for the differences is the difference in universities' efforts in supporting sustainability.

### 4.11 Influence of climate change education on behaviour

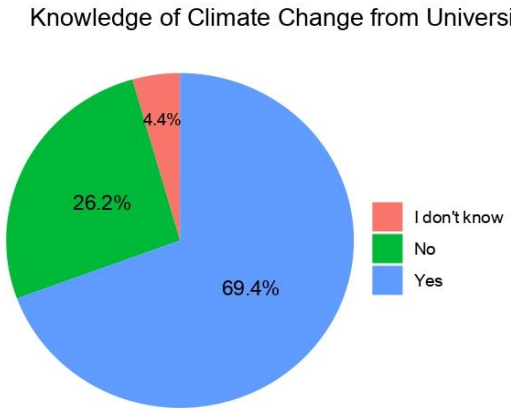



**Figure 4.14: Influence of climate change education on behaviour**

Survey data show that 69.4% of people admit that the climate change training gained from their college has changed their daily habits; 26.2% say no impact, and 4.4% are unsure. This implies that university education is quite important in influencing the environmental attitudes of students.

A study by (Imran et al., 2024) revealed that environmental education shapes sustainable values and attitudes among students. Also, a research conducted by (Nwuche & Enyia, 2024) revealed that education plays a fundamental role in advancing sustainable development by harnessing its resources and fostering a spirit of independence amongst students.

These findings align with the result from this study, reinforcing the critical role of university education in fostering climate-conscious behaviours among students. However, the presence of a notable minority (26.2%) who reported no influence suggests the need for more comprehensive and engaging climate education programs to ensure broader behavioural change.

### 4.12 Role of Universities in climate change education

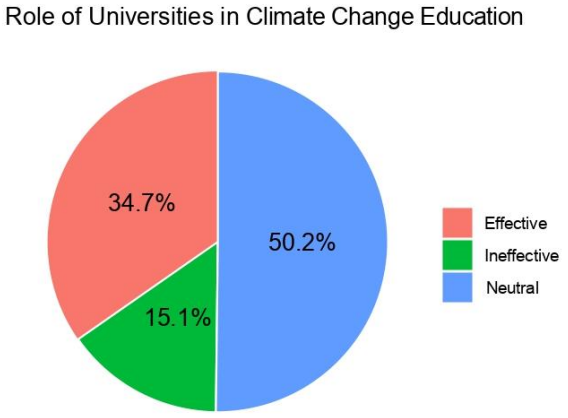



**Figure 4.15: Role of universities in climate change education**

According to figure 4.15, when assessing the role of the student's university in climate change education, 50.2% of respondents reported it as neutral, 34.7% effective, and 15.1% ineffective. This distribution implies that most people are unsure of their influence even if a large amount recognizes the work of their universities.

Particularly in Nigeria, universities differ on how much they emphasise on climate change education. Although some colleges have included sustainability into their courses, difficulties remain in aligning educational outcomes to industry needs (Reimers, 2021). This

explains the necessity for universities to adapt their programs to better prepare students for emerging green industries.

To enhance the effectiveness of climate change education, universities could strengthen collaborations with industry stakeholders, ensuring that curricula are adapted to evolving environmental challenges and employment opportunities.

### 4.13 Student's engagement with climate change education

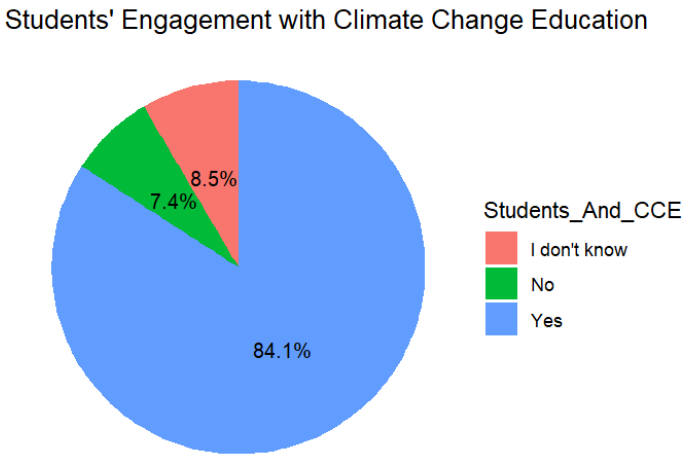



**Figure 4.16: Student's engagement with climate change education**

The survey results indicate that a substantial majority (84.1%) of respondents believe that students who receive climate change education are more likely to engage in sustainable practices. In contrast, 7.4% disagree, and 8.5% are uncertain. This strong endorsement underscores the perceived effectiveness of climate change education in fostering sustainable behaviours among students.

Globally, studies support this perception. Research indicates that environmental education programs enhance students' environmental knowledge, attitudes, and behaviours, leading to increased participation in sustainability initiatives. For example, a study conducted by (Mahbub, 2024) in Oklahoma State University found that students exposed to comprehensive environmental education were more likely to adopt eco-friendly practices, such as recycling and energy conservation.

In the African context, similar trends are observed. According to research conducted in Pwani University in Kenya, schools that offer comprehensive environmental education programs report increased student involvement in sustainability projects and better community participation in environmental preservation (Chavula et al., 2024).

In Nigeria, environmental education is also very important. Students who receive environmental education are more likely to participate in activities such as tree planting, waste management, and advocacy for environmental policies (NWANKWO & Nkamnebe, 2021). However, challenges such as inadequate resources and trained personnel have been identified as barriers to the effective implementation of these programs.

### 4.14 Qualitative Insights from Focus Group Discussions and Key Informant Interviews

To give a thorough grasp of how students and members of the various universities perceive climate change, focus groups and key informant interviews were used to collect qualitative insights in addition to quantitative data.

#### 4.14.1 Focus Group Discussions (FGDs):

Students from different departments participated in three focus group discussions (FGDs) to learn more about how they view climate change education and how it affects sustainable practices. Several recurrent themes emerged from the discussions:

1. **Climate change awareness:** According to the participants, they are aware of climate change and have seen its effects in their daily lives and surroundings. "During the recent heatwave, the environment became unbearably hot, making it difficult to concentrate on lessons or our daily lives," one student said during a focus group discussion. This is consistent with the survey's findings, which show that most participants acknowledge their awareness of climate change and its effects.
2. **Perceived Relevance of Climate Education:** According to the participants, it is important to integrate climate change topics into the curriculum because doing so will increase student understanding of environmental issues and make the subject matter more relatable. One student noted, "*Before now, I never realized how my daily actions contributed to climate change*."
3. **Behavioural Changes:** Some students reported taking part in tree planting events and embracing sustainable practices like using less plastic and saving energy, organised by the university.
4. **Implementation Barriers:** A few participants mentioned a lack of institutional support and limited resources as reasons for the difficulties in implementing sustainable practices. One of the participants said; "*If the institution makes this subject mandatory and provide needed resources, we will continuously engage in practises that help our environment"*.

### 4.14.2 Key Informant Interviews (KIIs):

Interviews with faculty members and administrative staff provided additional perspectives to the subject matter:

1. **Climate change education as a priority:** Some lecturers admitted that it is not a priority in their university, but they are aware of its impact while others admit it is a priority, and the university is making effort towards increasing awareness.
2. **Climate change as a course:** Many lecturers expressed that there are not a lot of courses related to climate change being taught in the university. A lecturer shared: "*I have taught a few topics that is a bit related to climate change to my students in the department of geology, but I can't say about other lecturers or other departments."* Another shared: "*I assume that the department of geography, geology or maybe health sciences take on few courses relating to climate change, but this is just an assumption."*
3. **Faculty Commitment:** Lecturers agreed that it was important to incorporate climate change topics into their teaching and curriculum but pointed out a need for professional development to effectively deliver this content.
4. **Institutional Policies:** The participants although admits that at least one or two activities on combating climate change has been introduced to the university, there has been no continuity and low student engagement. They also admit to one or two collaborations with climate change experts to create public lectures or seminars to create awareness on climate change.
5. **Proposed recommendations:** Administrators proposed policies efforts to promote sustainability on campus, but admitted to some of the barriers that might limit these policies such as funding, and policy implementation.

# CHAPTER FIVE

# CONCLUSION AND RECOMMENDATION

## 5.1 Conclusion

This study reveals that there is a moderately high awareness level of climate change among university students in Kogi State. Many students have heard about climate change and climate risks, are aware of the causes and effects of climate change and have been affected in one way or the other by the impact of climate change. But some students know nothing about the phenomenon and its impacts on their lives. Thus, it is necessary that universities create awareness campaigns to create awareness for the students on climate change. The government can also take this up as well and start awareness campaigns for the public on the same issue to create awareness about the impact of climate change. Harnessing the internet for this cause is also a good option as online seminars and webinars to raise awareness can be carried out.

Universities must also establish climate change awareness clubs. These clubs are essential in promoting student engagement in combating the impact of climate change and encouraging advocacy.

Most importantly, there is a need to include studies on climate change in the university curriculum and tag them as compulsory.

This study has several strengths. To the best of my knowledge, this is the first attempt to examine perceptions about climate change among university students in Kogi State, Nigeria. The study has examined the perceptions of students from different academic disciplines to provide an understanding of the differences in perception by discipline. Also, examining the role their university is playing in climate change education is an added strength. One limitation of this study is that it includes fewer respondents from the science department. No equal distribution of respondents across departments and faculty. Future studies can overcome these limitations to provide a better understanding of climate change perceptions among students that cut across different departments including the science department.

## 5.2 Recommendation

Based on the findings from this study, several recommendations can be made:

1. This study recommends the mandatory inclusion of climate change in the university's curriculum. This will create an informed population and mobilize the students who

are future leaders on the importance of bracing up to the challenges of climate change which makes the fight against climate change much easier.

2. There is also a need to establish climate change awareness club in the universities in Kogi State. This is to effectively and actively share information that will help combat climate change.
3. More research and reports on climate change should be encouraged and promoted. This builds engagement and involvement especially if it involves various stakeholders ranging from the academic community to those who might be completely unaware of the phenomenon.
4. The universities should also equip their information centres with adequate climate change materials for more access to information on this topic.
5. Sustainability activities such as waste management, tree planting and energy conservation should be promoted in these universities.
6. Seminars/workshops centred on climate change should be promoted. Students get to share their experiences as a result of the impact of climate change on their environment and temporary solutions can be provided (for example, alternative means of learning or transportation routes during adverse effects of extreme weather events).

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# APPENDICES

## APPENDIX 1: GENERAL QUESTIONNAIRE FOR STUDENTS

**Section A: Demographic Information**

1. Age:

- 18–22
- 23–27
- 28–32
- 33 and above

2. Gender:

- Male
- Female
- Prefer not to say

3.Marital Status:

- Married
- Single
- Widowed

4. University Attending:

- Federal University Lokoja
- Prince Abubakar Audu University
- Confluence University of Science and Technology
- Salem University

5. Course of Study:

_____

6. Level of Study:

- Undergraduate

- Postgraduate

- Other (specify)

**Section B: Awareness and Understanding of Global Climate Change**

1. Have you heard about the term “climate change”?

   - Yes

   - No

2. How did you first learn about climate change?

   - School/University

   - Social Media

   - News/Television

   - Family/Friends

   - Other: _____

3. How would you rate your understanding of climate change?

   - Very Poor

   - Poor

   - Average

   - Good

   - Excellent

4. How frequently do you come across discussions or information on climate change?

   - Daily

   - Weekly

   - Monthly

   - Rarely

   - Never

5. Do you believe climate change poses a risk to your community?

- Yes

- No

- Not sure

6. Which of the following do you believe are key contributors to climate change?

- Deforestation (cutting down of trees)

- Burning of fossil fuels (coal, oil, gas)

- Industrial emissions

- Agricultural activities

- Natural processes

- I am not sure

7. Which of the following do you think are the effects of climate change?

- Rising global temperatures

- More frequent natural disasters (e.g., floods, droughts)

- Loss of biodiversity

- Rising sea levels

- Changes in rainfall patterns

- Food insecurity

- Not sure

8. To what extent do you believe human activities are responsible for global climate change?

- Not at all

- Completely

- Not sure

9. In your opinion, how significant is the threat of climate change compared to other local issues?

- Very significant

- Somewhat significant

- Not significant

**Section C: Attitudes and Perception of Climate Change and its impacts on their local environment**

1. Do you believe climate change is a serious issue in Nigeria?

- Yes
- No
- Not sure

2. What changes have you noticed in your local environment that you believe are linked to climate change?

- Increase in temperature
- Irregular rainfall patterns
- More frequent floods
- Longer periods of drought
- Decreased agricultural productivity
- Loss of biodiversity (plants/animals)
- Other _____

3. Have you personally experienced any impacts from climate change (e.g., health issues, economic losses)?

- Yes (please specify): _____
- No

4. How concerned are you about the potential future impacts of climate change on your community?

- Not at all concerned
- Slightly concerned
- Moderately concerned
- Very concerned

- Extremely concerned

. How likely are you to take personal action to mitigate the local impact of climate change?

- Not likely

- Very likely

6. Do you believe your local government is doing enough to address climate change in Kogi State?

- Yes

- No

7. How willing are you to participate in local initiatives aimed at reducing the impact of climate change?

- Not willing

- Very willing

**Section D: Role of educational institutions in Climate Change Education**

1. Have you received any form of education about climate change in your university?

- Yes

- No

- Not sure

2. If yes, in which way have you received this education?

- Through courses or lectures

- Through seminars or workshops

- Through environmental clubs or student organizations

- Through university campaigns or events

- Other _____

3. How important do you believe it is for universities to include climate change education in their curriculum?

- Not important

- Very important

4. Do you think climate change education is included adequately in your university's curriculum?

- Yes

- No

- Not sure

5. How would you rate the role of your university in increasing your awareness and understanding of global climate change?

- Very effective

- Effective

- Neutral

- Ineffective

- Very ineffective

6. How has your university influenced your perception of the importance of climate change?

- Significantly influenced

- Somewhat influenced

- Neutral

- Not influenced at all

7. What additional steps do you think educational institutions should take to improve climate change awareness and understanding among students?

- Introduce more courses focused on climate change

- Organize more seminars and workshops on environmental issues

- Establish partnerships with environmental organizations

- Create opportunities for students to participate in climate action projects

- Include climate change in all courses, regardless of discipline

- Other

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8. Do you think the knowledge you've gained about climate change in your university has influenced your daily behaviour?

- Yes

- No

- Not sure

9. If yes, how has it influenced your behaviour?

- I try to conserve energy and water

- I participate in recycling and waste reduction

- I discuss climate change issues with others

- I support climate action initiatives

- Other

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10. Has your university provided sufficient information about how climate change impacts your local environment?

- Yes

- No

- Not sure

11. In your opinion, what are the most important topics that universities should cover regarding climate change?

- Causes and effects of climate change

- How to mitigate climate change

- Local impacts of climate change

- International climate policies and agreements

- Personal and community actions against climate change

- Other _____

12. Do you believe that students who receive climate change education are more likely to engage in sustainable practices?

- Yes

- No

- Not sure

## APPENDIX 2: INTERVIEW QUESTIONS FOR FOCAL GROUP

1. What is your name?
2. What is your year of study?
3. What is your course of study?
4. Do you have any relevant experiences that relates to climate change? (coursework or extracurricular activities)
5. How would you describe climate change in your own words?
6. Have you learned about climate change in any of your classes? If so, what was the most impactful lesson?
7. Do you think climate change is affecting Nigeria specifically? If yes, what examples come to mind?
8. Do you see evidence of climate change impacts in Kogi State or in your local community? If so, how?
9. Do you believe climate change poses a risk to your community?
10. Which climate risk do you think poses the greatest threat to your community?
11. How concerned are you about the impacts of climate change in the future?
12. Do you think it's important for individuals to take action to address climate change? Why or why not?
13. What personal actions, if any, do you take to reduce your environmental impact (e.g., recycling, using less plastic)?
14. Do you feel that your university supports climate-friendly practices? If so, in what ways?
15. What challenges or barriers prevent you and other students from taking action against climate change?
16. Do you think there is enough support or awareness about climate change on campus?
17. How do you feel the university could better educate or support students in understanding climate change?
18. What role do you think Nigerian universities should play in climate change mitigation?

## APPENDIX 3: INTERVIEW QUESTIONS FOR KEY INFORMANTS

1. What is your area of work?
2. How long have you been working in this area?
3. Are there any specific work or projects related to climate change awareness or action in your university?
4. How important is climate change awareness within the university's current priorities?
5. Has the university taken any formal steps to address or include climate change within its curriculum or campus activities?
6. In your view, how aware are students about climate change and its impacts?
7. How prepared do you believe your university is to handle climate-related risks?
8. Are there any specific policies or practices at the university aimed at reducing environmental impact (e.g., energy conservation, waste management)?
9. How does the university collaborate with external organizations or the government to address climate-related issues?
10. Do you believe that integrating climate change topics into courses or student activities would be effective? Why or why not?
11. Are there any specific courses, programs, or initiatives within the university that focus on climate change?
12. What challenges does the university face in implementing climate-related initiatives (e.g., funding, awareness, student engagement)?
13. What do you see as the main obstacles in promoting climate change awareness and action among students?
14. How do you envision the role of Nigerian universities evolving in the context of climate change?
15. What future actions or policies would you like to see implemented at the university to enhance climate action and awareness?
16. Are there specific policies or initiatives in place within your university or community to reduce climate risks (e.g., flood-resistant infrastructure, shaded walkways, or emergency plans)?


LECTURE HALL 1
HUMAN PHYSIOLOGY LECTURE HALL
HUMAN ANATOMY LECTURE HALL