ISSN No:-2456-2165

# Opinion of Undergraduates on the Influence of Climate Change on Food Security in Lagos State, Nigeria

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**Abstract:- This study investigated the opinion of undergraduates on the influence of climate change on food security in Lagos State. Quantitative and qualitative methods were utilized to conduct a descriptive survey. Three research questions were raised to guide the study. Data was gathered using structured questionnaire and a Focus group discussion. The population of the study is 1149 undergraduates from which a sample size of 296 was drawn using a multi-stage sampling procedure. A validated questionnaire was utilized to obtain data from the participants. Mean and Standard deviation were used to analyze data. According to the results, human activities are the major causes of climate change in the present world. The influence of climate change on food security includes high food prices, low agricultural output, increased pest attack, food spoilage and contamination. The study revealed that man-made efforts can help prevent local climate change through promoting environmental health thereby encouraging food security. Such efforts include investing in energy efficient appliances, reducing water waste, avoiding open burning and driving less. Findings also revealed that growing a vegetable garden in our homes and planting at least one tree might help to alleviate the environmental hazard of climate change. Conclusions were reached, and the study suggests that appropriate measures should be put in place to ensure environmental friendly practices to prevent further degradation.**

***Keywords:-*** *climate change, undergraduates, food security, Lagos State, Nigeria.*

## I. INTRODUCTION

Climate change has been identified as a serious danger to the existence of all living creatures. It has an impact on social and environmental health factors such as clean air, safe drinking water, healthy food, and enough housing, all of which are necessary for life. Long-term changes in the mean variability of the climate that last for decades or more are referred to as climate change. Climate is the long-term atmospheric state of a certain area. The long-term total of atmospheric factors such as solar radiation, temperature, relative humidity, and precipitation, as well as their fluctuations through time, is referred to as the climatic condition. Climatic change is described as a long-term deviation from the mean or changing climatic features. According to the Intergovernmental Panel on Climate Change (IPCC, 2014), human expansion of the greenhouse effect is the primary cause of current climate change (Ani et al, 2020). Humans are progressively increasing the quantities of greenhouse gases and aerosols, both of which influence climate (Enete, 2020). Greenhouse gases emit detrimental effects of greenhouse, which causes global warming. Greenhouse gases such as nitrous oxide (N2O), carbon dioxide (CO2), methane (CH4), and chlorofluorocarbons capture heat released from the planet and release it into space, resulting in global warming; a persistent manifestation of climate change (CFCs). According to Ani et al (2020), greenhouse gases serve to keep the earth's atmosphere warm enough for living organisms such as plants and animals. Human industrial and agricultural activities, on the other hand, have increased atmospheric emissions of these gases, resulting in an extended greenhouse effect that causes a rise in mean atmospheric temperature, sometimes known as global warming. Humans' use of fossil fuels, coal, and oil has resulted in high levels of carbon dioxide in the atmosphere. Synthetic industrial compounds known as chlorofluorocarbons (CFCs) have depleted the ozone layer, leading to global warming. Changes in the natural composition of greenhouse gases, on the other hand, amplify the greenhouse effect, warming the globe. The warmer temperature of the earth's atmosphere, which varies by area, causes more evaporation and precipitation. The greenhouse effect also contributes to ocean warming, which causes glaciers and ice sheets to partly melt, resulting in increasing sea levels. High amounts of atmospheric $CO_2$ have both beneficial and negative impacts on agricultural output, according to research. According to the research, some crops thrive in this environment while others do not. Climate change has resulted in floods, droughts, and high temperatures, among other things. These circumstances have resulted in agricultural losses, threatening farmers' livelihoods and posing food security concerns to certain governments, particularly those in developing countries (Oyinloye, et al. 2018).

Food security is described as having consistent physical and economic access to adequate, safe, and nutritious food to suit one's dietary requirements and food choices in order to live an active and healthy lifestyle (Food and Agricultural Organization [FAO], 2011). Healthy food should be available to everyone (food access); adequate for all (nutritious and produced from a sustainable food system); and acceptable to all (culturally appropriate). Food insecurity, on the other hand, denotes a lack of sufficient food and may be either chronic or transitory. The diet is

ISSN No:-2456-2165

consistently insufficient in chronic food insecurity owing to a lack of resources to make or acquire food (Adeoti, 2016). Food insecurity is classified into the following categories: Acute: When there is extreme hunger and malnutrition to the point that lives are endangered (e.g., famine); When food insecurity emerges as a result of a particular transitory event; Chronic: When one's capacity to satisfy one's nutritional needs is constantly jeopardized. The majority of Nigerian families are food insecure; not because food is not available or accessible in the market, but because they cannot afford to buy adequate healthful meals to satisfy their dietary requirements as a result of hyperinflation and economic instability, which reduces purchasing power (FAO, 2011). According to FAO (2011), food insecurity affects around 200 million people in Sub-Saharan Africa, including Nigeria. Each year, the number of people who are food insecure grows by one million, as does the number of people who are malnourished.

Food insecurity in Nigerian communities is at an all-time high. This is shown by the high pricing of basic commodities like rice, garri, yam, beans, fish, vegetable oil, palm oil, and many more. Millions of lives are imperiled in vulnerable areas, notably in Africa, where poverty, malnutrition, and hunger-related mortality are common (Janice and Ford-Jones, 2015). Rising food costs may have a devastating impact on the poor. The problem has the potential to postpone the achievement of significant health-related Sustainable Development Goals. Every year, an estimated 13 to 18 million people, largely children, die in underdeveloped nations as a result of hunger, malnutrition, and poverty-related diseases. This equates to roughly 40,000 individuals each day, or 1,700 per hour. One billion people, or 20% of the world's population, live in homes that cannot afford the food required to maintain regular employment (Pottier, 2019). According to Ilaboya et al. (2012), this might leave developing nations, notably Nigeria, with a crippled generation that is both physically and mentally stunted and is chronically in need of support.

Climate change's concerns to human security have sparked widespread concern, prompting a slew of worldwide initiatives and legislation aimed at reducing human activities that contribute to climate change. For example, the Kyoto Protocol aimed to minimize greenhouse gas emissions from industrial activities in nations all over the globe. Nigeria, like the rest of the globe, is not immune to the effects of climate change. Climate change has had an influence on the vegetative areas of Nigeria. According to a research, climate change is becoming a severe danger to agricultural output in Nigeria. Some formerly well-drained agricultural plains have recently flooded, and the region's agricultural operations have been impeded by the rising aridity of the Sahel land Sudan savanna belts (Ojo and Adebayo, 2012). Excessive precipitation, irregular rainfall onset and cessation, increasing temperatures, and fluctuations in relative humidity are other characteristics of climate change that have a significant impact on agricultural operations and food systems in Nigeria. This change has disturbed the seasonal cycle of food production and distribution, resulting in a supply shortfall, increased food costs, and reduced food availability (Oyinloyeetal., 2018).

According to studies, climate change is a risk factor for food insecurity in a number of countries, including Nigeria. Food hunger causes security issues in certain situations because of the friction caused by the struggle for control over restricted agricultural resources. According to a Food and Agricultural Organization (FAO, 2022) study titled "The State of Food Security and Nutrition in the World," climate change, national economy, and conflict are the key causes of global food insecurity. Nigeria has been identified as a nation where these three FAO-defined factors have a major influence on the degradation of food security.

Scholars have published various studies on the causes and implications of climate change in Nigeria and other countries, but concerns concerning people's actions at the home level in mitigating the risk have gotten less attention. There has been little study or evidence to address the problem of household food insecurity, particularly in Lagos. As a result, the research focuses on students' opinions of climate change's impact on food security in Lagos State, Nigeria.

## II. RESEARCH QUESTIONS

The following research questions guided the study:

- What are the causes of climate change?
- What influence does climate change have on food security?
- What strategies can be adopted to prevent climate change at the local levels?

## III. METHODOLOGY

- **Study Design:** The research design adopted for this study was descriptive survey research design.
- **Scope of the Study:** The research was conducted at four tertiary institutions in Lagos State. University of Lagos (Unilag), Federal College of Education (Technical) Akoka [FCE(T)A], AdeniranOgunsaya College of Education (AOCOED), and Yaba College of Technology (YCT(UNN)) are the tertiary institutions. The chosen institutions are located in the Lagos State LGAs of Ojo and Yaba.
- **Population for the Study:** The overall population was 1,149, which included all Home Economics and Business Education students from the four tertiary schools chosen for the research. As at the period of study, University of Lagos (Unilag) has two hundred and fifty-four (254) students; the Federal College of Education (Technical) Akoka [FCE(T)A] has two hundred and seventy-eight (278) students; the AdeniranOgunsaya College of Education (AOCOED) has two hundred and forty-six (246) students; and the Yaba College of Technology, affiliated to the University of Nigeria, Nsukka [YCT(UNN]has three hundred and seventy-one (371).Thisset of learners (undergraduates) is regarded to be capable of educating the broader public about food security issues as well as providing environmental awareness.
- **Sample and Sampling Technique:**The survey included 296 undergraduates from the aforementioned academic institutions. The Taro Yamane formular for estimating

ISSN No:-2456-2165

sample size was used to compute the population sample size. A multi-state sampling strategy was utilized in the study. Lagos state was chosen on purpose because of its multi-ethnicity and population size. It has the most population, accounting for more over 5% of the total. Furthermore, the population growth rate in Lagos state is 8%, resulting in the state accounting for around 37% of Nigeria's urban population (Odebiyi, 2010). The second stage was to choose four tertiary institutions. In the third step, two departments were chosen based on the ease with which data could be obtained: Home Economics and Business Education. Thus, a total of 8 departments were selected for the study.

- At the fourth stage, using Neymann's allocationformular for stratified sampling, the number of subjects to be selected from each department was determined. The allocated sample size was proportionately divided among the departments and the total number of students in each department constituted the sampling frame in each of the schools. The allocated sample was then divided by the number of departments in order to ascertain the number of students that will participate in the study in each department. At stage 5, the subjects were selected from each department by simple random sampling using statistical table of random numbers until the required number for department was obtained.
- **Instrument for Data Collection:**To collect data, a questionnaire and a Focus group discussion were used. "Influence of Climate Change on Food Insecurity (ICCFI)" was the title of the survey. It was centered on the research questions. The items were graded on a four-point scale, with SA equaling 4, A equaling 3, D equaling 2, and SD equaling 1. The researchers developed study-related focus group discussion questions and utilized them as a framework for conversation/interaction with students, and their replies were recorded. The tool was verified by two specialists in regional planning and one in home economics. Cronbach's Alpha was used to analyze the internal consistency of the questionnaire, yielding an alpha value of 0.82.
- The questionnaires were handed to 296 students by the researchers. There were efforts made to ensure that the items were completely filled, with no gaps. Two hundred and ninety-two (292)/99% of the surveys givenwere returned.
- **Method of Data Analysis:**Data were evaluated using the mean and standard deviations. Mean ratings of 2.50 and above were regarded to be agreed upon, while ratings of 2.49 and below were considered to be disputed upon. The replies of the participants from the Focus group discussion were collected, summarized, and utilized to support the study's conclusions.
- **Ethical Consideration:**The heads of departments at the listed universities granted permission for this study. Students who participated in the research provided informed consent, and information was kept anonymous throughout the study.

## IV. RESULTS

| S/N | Causes of climate change | X | SD | Remark |
|---|---|---|---|---|
| **Natural causes** | | | | |
| 1. | Movement of crustal plates | 2.00 | 1.02 | Disagreed |
| 2. | Variation in solar variation | 2.57 | 0.99 | Agreed |
| 3. | Volcanic eruptions | 2.66 | 1.02 | Agreed |
| 4. | Orbital changes | 2.65 | 1.10 | Agreed |
| **Man-made causes** | | | | |
| 1. | Deforestation | 3.31 | 0.58 | Agreed |
| 2. | Generating power | 3.53 | 0.92 | Agreed |
| 3. | Emissions of pollutants | 3.40 | 0.69 | Agreed |
| 4. | Over-population | 3.20 | 0.67 | Agreed |
| 5. | Landfills | 3.02 | 1.07 | Agreed |
| 6. | Fossil fuel | 2.85 | 0.94 | Agreed |
| 7. | Mining | 3.52 | 0.69 | Agreed |
| 8. | Bush burning | 3.04 | 0.86 | Agreed |

Table 1: Mean Responses of Undergraduates on Causes of Climate Change.

Source: Authors' compilation, February 2022

Table 1 contains the mean and standard deviation of natural and man-made causes of climate change. The mean replies varied from 2.57 to 3.53, which is higher than the cutoff threshold of 2.50, except for item 1 (Natural cause: movement of crustal plates), which was disputed (X= 2.00; SD=1.02). Man-made causes, on the other hand, had the highest mean values ranging from 2.85 to 3.53, with a standard deviation ranging from 0.58 to 1.075. As a result, human activities are the primary causes of climate change. This means that their mean replies were not dissimilar. According to the findings of a focus group discussion, other man-made causes of climate change include the activities of manufacturing companies and the dumping of hazardous chemicals into the water.

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| S/N | Influence of climate change on food security | X | SD | Remark |
|---|---|---|---|---|
| 1. | Increased pest attack on plants and animals | 2.76 | 1.00 | Agreed |
| 2. | Reduced crop yield | 2.86 | 1.06 | Agreed |
| 3. | Spike in food prices | 3.40 | 0.69 | Agreed |
| 4. | Reduced outcome from fishing activities | 2.76 | 1.00 | Agreed |
| 5. | Reduced quality of food | 2.57 | 0.99 | Agreed |
| 6. | Contributes to food spoilage and contamination | 2.77 | 1.14 | Agreed |
| 7. | Disruption in food availability and supply | 2.85 | 0.94 | Agreed |
| 8. | Low agricultural output | 3.53 | 0.92 | Agreed |
| 9. | Poor aquatic live | 2.76 | 1.00 | Agreed |
| 10. | Improves food security | 1.06 | 1.78 | Disagreed |

Table 2: Mean Responses of Undergraduates on Influence of Climate Change on Food Security

Source: Authors' compilation, February, 2022

Data presented in Table 2 shows the influence of climate change on food security. All the items were agreed upon as influence of climate change on food security except item 10 (Improves food security (X= 1.06, SD=1.78) which was rejected. Hence, climate change does not improve food security. Findings from the focus group discussion revealed that the influence of climate change on food security also includes inability to buy and consume adequate foods due to food insecurity.

| S/N | Strategies for preventing climate change | X | SD | Remark |
|---|---|---|---|---|
| 1. | Powering one's home with renewable energy | 2.95 | 1.08 | Agreed |
| 2. | Avoid open burning | 3.04 | 0.86 | Agreed |
| 3. | Investing in energy-efficient appliances | 3.31 | 0.88 | Agreed |
| 4. | Reducing water waste | 3.20 | 0.67 | Agreed |
| 5. | Responsible eating | 2.85 | 0.94 | Agreed |
| 6. | Reduce driving | 3.04 | 0.86 | Agreed |
| 7. | Buy energy efficient bulbs | 2.88 | 1.08 | Agreed |

Table 3: Mean Responses of Undergraduates on Strategies for Preventing Climate Change at the Local Levels

Source: Authors' compilation, February, 2022

Data presented in Table 3 shows the opinion of undergraduates on the strategies for preventing climate change at the local levels.All the items were accepted as ways by which climate change can be prevented at the local levels. The mean values of the responses are above 2.50 while standard deviation ranged from 0.67 to 1.08indicating that the mean responses of the respondents were not far from each other.Findings from the focus group discussion revealed that having a vegetable garden in our respective homes and planting at least a tree can help to prevent the menace of climate change on our environment.

## V. DISCUSSION OF FINDINGS

This poll provides students' thoughts on climate change's influence on food security. According to the results, man-made, also known as human activities are the major contributors to climate change in the world today. This backs up the claim made by Global Climate Change (2022) that human activity is the cause of increased greenhouse gas concentrations over time. The use of fossil fuels has increased the amount of carbon dioxide in the atmosphere (CO2). This increase occurred as a consequence of the coal or oil burning process, which combines carbon in the air with oxygen to form $CO_2$. Clearing land for agriculture, industry, and other human activities has increased greenhouse gas concentrations dramatically (Global Climate Change, 2022). The study also showed that the industrial business contributes to climate change via inadequate waste disposal practices, such as the release of toxic substances into the oceans. Reducing greenhouse gas emissions via improved transportation, waste management, better food and energy choices may enhance health, particularly through reduced air pollution. Overpopulation has also been cited as a contributing factor to climate change. Increased population causes greater need for food, more vehicles, more carbon dioxide in the atmosphere, and more demand for housing and clothing. This finding is corroborated by the submissions of (Rinkesh, 2022) that because transportation is responsible for the transfer of goods and services, increased food consumption will need more transportation. More transportation demand increases pollution in the air and traffic on the roads, resulting in longer wait times at traffic lights and the consumption of more fuel. Furthermore, the rising demand for housing mandates the removal of plants and trees to make way for dwellings, schools, and hospitals. Findings also indicated that movement of crustal plates (see table 1) was not recognized as a natural source of climate change. This implied that the subjects were unaware of it. According to Climate Science Investigations (CSI, 2022), landmasses are dragged along to various locations and latitudes as tectonic

plates shift over geological timescales. These changes, however, have an effect on global air and ocean water circulation patterns, as well as continent temperatures.

Climate change, according to the report, has a major and negative impact on food security (see table 2). According to the results, climate change impacts food supply, availability, and accessibility by increasing food prices and decreasing agricultural productivity, resulting in food insecurity. This corroborated the United Nations Environmental Protection Agency's [EPA], 2022) observations that climate change affects food security at the global, regional, and local levels. Climate change has the potential to disrupt food supply, limit food availability, and impair food quality. Temperature increases, changes in severe weather conditions, changes in precipitation patterns, and decreasing water availability, for example, might all result in poorer agricultural productivity. Increases in the frequency and severity of weather events may also impede food delivery and raising food prices. Furthermore, any disturbance in food distribution and transportation as a result of climate change may have a significant impact not just on food safety and quality, but also on food availability (EPA, 2022). Climate change-related food price hikes have a significant impact on human food consumption habits. According to the results, one of the implications of climate change on food security is the inability to obtain and consume adequate meals as a result of food poverty. Rain-fed agriculture accounts for more than 90% of agricultural production in Nigeria, which has 79 million hectares of arable land, 32 million of which are cultivated, according to FAO (2012). Food prices have risen dramatically during the last seven years. This is seen in the cost of Nigerian staples like as rice, garri, fish, vegetable oil, palm oil, and so on. A bag of rice, for example, has grown from N7,500 in 2015 to N32,000 in 2020 and has remained to this day. This is catastrophic for the poor. Only the rich can afford to buy and consume in sufficient quantities. Malnutrition induced by food insecurity endangers the poor's health. This is because increasing food prices worsen poverty, food insecurity, and malnutrition. Food price volatility has placed a substantial burden on global food security since many Nigerians depend on the market for food and are vulnerable to increasing food prices (FAO, 2011). Similarly, Emeet al. (2014) underlined that climate change has a significant influence on food security in unexpected ways owing to its negative impact on pests, crop diseases, agricultural productivity, animal husbandry and humans.

According to the results, local climate change options include investing in energy-efficient equipment, reducing water waste, avoiding open burning, and driving less. Local climate change prevention will increase environmental sustainability and, as a consequence, food security over time. This demonstrated that man-made measures may help with food security. According to FAO (2011), food security occurs when all people have physical and economic access to enough, safe, and nutritious food to meet their dietary needs and food choices for an active and healthy life at all times. Findings also revealed that growing a vegetable garden in our homes and planting at least one tree might help to alleviate the environmental hazard of climate change. When families have access to adequate fresh vegetables for an active and healthy lifestyle, such as pumpkin leaf (Ugu), okra, cocorusosidentalis (Ewedu), spinach, and greens, food insecurity may be considerably reduced. Vegetables are high in vitamins and minerals. If the home has a vegetable garden, this is would be a good option. Due to the fact that fruits and vegetables are expensive, many people leave them off their shopping list. They choose starchy foods because they believe they are more satisfying and will delay hunger. This is consistent with FAO's (2011) assertion that food insecurity drives families to shift their dietary patterns away from micronutrient-rich foods like milk, meat, fruits, and vegetables and toward cheaper (starchy) goods. Also, if people are so poor that they simply cannot afford the same quantity of calories at the new higher price, their energy intake will plummet.

## VI. CONCLUSION

In the modern world, human activities are the primary drivers of climate change. High food costs, decreased agricultural productivity, increased insect assault, food spoilage and contamination are all consequences of climate change. Man-made initiatives may aid in the prevention of climate change by boosting environmental health and thereby increasing food security. Investing in energy-efficient equipment, decreasing water waste, avoiding open burning, and driving less are all examples of such initiatives. In other words, climate change contributes not just to the decline of ecosystems, weather patterns, and sea-level increases, but also to the general quality of life we want on the globe. There are several things we may take to limit the amount of energy we use. Switching to renewable energy, adopting a more responsible diet and lifestyle, and limiting our use of nonrenewable items may all make a significant impact.

## VII. RECOMMENDATIONS

Based on the findings from the study, it is recommended that:

- To avoid future deterioration, appropriate measures should be put in place to guarantee environmentally friendly behaviors.
- People should be urged to be careful of their behaviors in order to mitigate the consequences of climate change.
- Every family should strive to have a food garden in their backyard.
- Environmental education should be included into university curricula. This will help to raise environmental consciousness and, as a result, improve environmental sustainability.
- The government should make food available, accessible, and inexpensive to the people. Subsidies and other intervention programs may help accomplish this.

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