



## Social Impact and Public Perception of Climate Change

Garba Shuaibu, Idris Isa Danladi  
Department of Science and Technology Education  
Bayero University, Kano-Nigeria.

### ABSTRACT

*This study investigated the social impacts and public perception of climate change, particularly among university students, which is crucial for developing effective adaptation strategies and disseminating accurate information about the consequences of climate change on sustainable health conditions. The research employed a descriptive survey design. The target population consisted of 1212 undergraduate students in Science and Technology Education at Bayero University, Kano-Nigeria. A random sample of 120 students was selected for data collection. The primary data collection tool used was a questionnaire titled "Social Impact and Public Perception of Climate Change Questionnaire." The collected data were analyzed using frequency counts and simple percentages. The findings highlighted that a significant majority of the respondents, 68 individuals (58.6%), strongly agreed that the social impact of climate change manifests as extreme weather conditions, which severely impede agricultural production, resulting in decreased quality and quantity of crops. Based on the study's results, it is recommended that governments, individuals, and the scientific community allocate more resources and funding to address the adverse effects of climate change.*

### ARTICLE INFO

#### Article History

Received: January, 2023

Received in revised form: February, 2023

Accepted: April, 2023

Published online: June, 2023

### KEYWORDS

Social Impact, Public Perception and Climate Change,

### INTRODUCTION

In July 2017, Radio Kano-Nigeria reported the loss of hundreds of lives and properties in Gwarzo Local Government Area of Kano-Nigeria due to heavy rainfall and resulting floods. When people were asked about the causes, they mentioned blockage of water drainage due to waste disposal or environmental pollution, extreme weather conditions, and changes in climate. Climate change can be defined as a change in weather patterns (Vanguard Nigeria's Newspaper, Wednesday, January 20, 2010, p. 34) over time or as environmental issues (Tagbo, 2010). Essentially, climate change refers to a pattern of change affecting global or regional climate, such as average temperature, wind, rainfall, or the frequency of extreme weather conditions. This variation can be caused by both natural processes and human activity. Human activities, such as increased release of greenhouse gases and widespread deforestation, have been attributed to climate change (IPCC, 2007). The abundance of greenhouse gases, including methane, nitrous

oxide, and chlorofluorocarbons (CFCs), contributes to the greenhouse effect and leads to the progressive depletion of the ozone layer in the stratosphere.

Public perception and understanding of climate change are influenced by various definitions and can shape its social impact. It is crucial to have a clear public perception of climate change to advance cognitive science related to public understanding and thinking about climate change. Weber and Stern (2011) argue that understanding the differences between public perceptions of climate change risk and the risk conceptualizations of experts engaged in scientific thinking is important. Lay people often perceive risks differently from experts, considering hazards more risky when they are unfamiliar or evoke negative emotions due to their catastrophic potential (Slovic, 1987). Therefore, it is important for individuals to perceive themselves at risk in order to take appropriate actions. Psychological distance, such as not perceiving personal vulnerability to risks, can affect how individuals perceive climate change (Fielding, 2012).

Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

Department of VScience and Technology Education, Bayero University, Kano.

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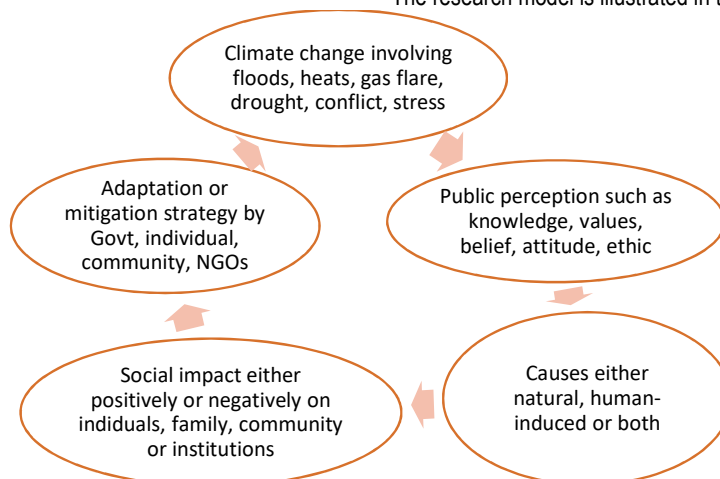
Public perception of climate change is often related to general knowledge, attitudes, beliefs, values, ethics, and experiences related to extreme weather and floods (Spence, Poortinga, and Pidgeon, 2012). However, people may view climate change as a distant problem affecting others in the past, present, or future, and may not connect it with human-induced causes such as deforestation, social instability, electricity usage, and fragile health. Social Impact Assessment practitioners consider social impacts of climate change to include personal living conditions, such as stress and conflicts, as well as changes that impact society as a whole, such as overpopulation, pollution, pressure on infrastructure, and poverty (World Bank, 2008). Assessing the social impacts of climate change is important for promoting sustainable development and well-being, as these impacts can have both positive and negative effects on individuals, communities, and institutions.

Perceptions of climate change can be associated with respondents' characteristics such as political values, gender, education, and social or economic position (Lorenzoni, Leiserowitz, Doria, Poortinga, and Pidgeon, 2006). For example, political and social conservatives may be less concerned about climate change and less supportive of policies aimed at addressing it. Cross-country comparisons have also revealed differences in public beliefs and conceptualizations of climate change (Ipsos, 2014). These differences can

influence how individuals perceive and understand climate change.

Nigeria, as a major agricultural and oil-producing country, has faced challenges in ensuring an optimal, reliable, and secure supply of food and energy, as well as addressing social instability (IPCC, 2007). Food and energy are crucial for achieving key policy goals and development targets. Challenges such as food insecurity, energy problems, and social instability have disrupted livelihoods, threatened environmental sustainability, and constrained economic growth and diversification. These challenges have led to significant environmental hazards for many Nigerians. Adaptation to climate change is necessary to mitigate its adverse effects and take advantage of opportunities provided by climatic environments (IPCC, 2007).

Kano, located in northern Nigeria, is the most populous state and the region's largest metropolitan center. It is an important commercial, industrial, and manufacturing city, as well as a diversified agricultural market. Kano's biodiversity, agricultural economies, markets, and networks, along with its tradition of environmentally-related activities, have had implications for climate change and individual/group livelihood strategies (Cline-Cole, 2006; Maconachie, 2007). This paper aims to examine the social impact and public perception of climate change among students in the Science and Technology Education Department at Bayero University, Kano-Nigeria. The research model is illustrated in the figure.





**Statement of the Problem**

According to Umeji (2010), the Northern States of Borno, Kebbi, Kano, Nassarawa, and Katsina have experienced a drop in crop yield over the past five years due to irregular rainfall patterns. The disruption of seasonal cycles, intensification of desertification, rising ocean levels, and submergence of riverine communities are some of the observable impacts of climate change. However, meaningful public action against climate change will only begin when the public understands its causes and their role in combating it. O'Connor, Board, and Fisher (1999) argue that responsible citizenship requires a concrete understanding of the causes of climate change, as voluntary actions to mitigate its effects cannot be expected without this knowledge. Therefore, an understanding of the causes and adaptation strategies of climate change is essential for a comprehensive assessment of its social impact and public perception.

The study aims to achieve the following objectives:

1. Determine the social impact of climate change among students in the Department of Science and

Technology Education at Bayero University, Kano-Nigeria.

2. Explore the students' public perception of climate change.
3. Investigate the causes and potential adaptation strategies of climate change.

The research questions are as follows:

1. To what extent do students perceive the social impact of climate change?
2. What are the students' public perceptions of climate change?
3. What are the causes and potential adaptation strategies of climate change?

The study utilized a survey research design and employed a questionnaire as the data collection instrument. The collected data were analyzed using frequency counts and simple percentages to address the research questions, while the research hypotheses were tested using the Chi-square test at a significance level of  $\alpha = 0.05$ . The population of the study consisted of 1212 students in the Department of Science and Technology Education at Bayero University, Kano-Nigeria. A random sample of 120 students, representing 10% of the total population, was selected for the study.

**RESULTS AND DISCUSSION**

**Table 1:** Students' Demographic Data (data analysis were based on N=116)

S/N	Variable	Frequency	Total
1	Program	B. Sc. (Ed) 96 (82.8% B. Tec (Ed) 20 (17.2%)	116 (100%)
2	Geopolitical zone	NW 98 (84.5%) NE 10 (8.6%) NC 6 (5.1%) SW 2 (1.7%) SE 6 (5.1%) SS 2 (1.7%)	116(100%)
3	Gender	Male 78 (67.2%) Female 38(36.8%)	116(100%)

Table 1 revealed that majority 96 (82.8%) of the respondents were B. Sc. (Ed) students, 98 (84.5%) were from North-west Geopolitical zone and 78 (67.5%) were male respondents.

**Research Question I:** To what extent have the students perceive the potential social impact of climate change?

To answer this research question data was collected and analyse using frequency count (F) and simple percentage (%).

Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

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**Table 2:** Responses on Social Impacts of Climate change

S/N	Item	Response					Total
		SA	A	UD	D	SD	
1	Extreme weather condition seriously hamper agricultural production resulting to low quality and quantity of the produces	68 (58.6)	31 (26.7)	5 (4.3)	4 (3.4)	4 (3.4)	112 (96.4)
2.	Poor agricultural productions as a result of climate change leads to food insecurity	49 (42.2)	44 (37.9)	9 (7.8)	8 (6.9)	2 (1.7)	112 (96.4)
3.	Climate changes forced youth to migrate to cities and border towns in-search of non-agricultural employment	35 (21.9)	53 (45.7)	15 (12.9)	7 (6.0)	3 (2.6)	103 (88.7)
4..	Migration of youth to urban areas for survival strategies found to be used in forming crises	21(18.1)	47(40.5)	22 (19.0)	15 (12.9)	7 (6.0)	112 (96.4)
5.	Incessant communal conflict and social instability are among the impact of climate change	16 (13.8)	38 (32.8)	22 (19.0)	24 (20.7)	12 (10.3)	112 (96.4)
6..	Planetary wave have significant impact on public heath, economic development and eco-system	23 (19.8)	35 (30.7)	28 (24.1)	15 (12.9)	7 (6.0)	108 (93.1)
7..	Climate change promote lack of equity and justice among vulnerable groups in places where the natural resources dependency are high e.g., fertile land, gas, gold, petroleum	37 (31.9)	35 (30.7)	22 (19.0)	12 910.3	8 (6.8)	114 (98.3)
8.	Climatological research and knowledge may combat all forms of climatic change and in-tum ensure food security and social stability	27 (23.3)	57 (49.1)	22 (19.0)	6 (5.2)	3 (2.6)	115 (99.1)
9..	Campaign, media report and policy on environmental hazards have significant impact on people attitudes toward its risk and adaptation act	41 (35.3)	54 (46.6)	15 (12.9)	4 (3.4)	2 (1.7)	116 (100)
10.	Changes in climate brought about increase in commodities prices and new techniques eg cross-breeding, entrepreneurial tendency,	22 (19.0)	59 (50.9)	21 (18.1)	14 (12.1)	1 (0.9)	107 (92.2)
11...	Staple foods such as guinea com (for tuwondawa), maize (tuwonmasara) and cassava of the people tend to change with climate	40 (34.5)	49 (42.2)	13 (11.2)	4 (3.4)	5 (4.3)	109 (94.0)

Table 2 showed that most 68 (58.6%) in Item one, 53(45.9%) in item three, 57 (49.1%) in item eight, 55 (47.4%) in item nine and 59 (50.9%) in item ten of the respondents

respectively agreed those items as their perceived social impacts of climate change.

**Research Question 2:** What are the students' public perceptions of climate change?

Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

Department of VScience and Technology Education, Bayero University, Kano.

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To answer this research question data were collected from the respondents and analysed with frequency (F) count and simple percentage (%).

**Table 3:** Students' Public Perceptions of Climate Change

S/N	Item	Response					Total
		SA	A	UD	D	SD	
12	I perceived heavy rainfall and floods have increased over the last five years resulting to loss of life and properties	18 (15.5)	34 (29.3)	2 (1.7)	9 (7.8)	---	63 (54.3)
13	I perceived cold weather and wind pollution have increase d over the last five years promoting good health condition and public well-being	20 (17.2)	40 (34.5)	9 (7.8)	36 (31.0)	9 (7.8)	114 (98.3)
14	Climate change refers to changes in climate related weather events or activities	48 (41.4)	42 (36.2)	6 (5.2)	7 (6.0)	3 (2.6)	106 (91.4)
15.	Climate change is abnormal increase on sea level, level of heat, acid rain, gas emission and oil spillage	28 (24.1)	39 (33.6)	21 (18.1)	20 (17.2)	3 (2.6)	111 (95.7)
16.	Changes in climate are perceived as desertification, dryness of streams, wind erosion, increase criminal activities, low yield of crops, floods, fragile health, migration of youth to cities and social crises	40 (34.5)	36 (31.6)	14 (12.1)	18 (15.5)	6 (5.2)	114 (98.3)
17	I have adequate knowledge of climate change that help me to explain it better	26 (22.4)	48 (41.4)	32 (27.6)	5 (4.3)	5 (4.3)	116 (100)
18.	Hazard had negative emotional effect since it is perceived as risky and requiring mitigation	34 (29.3)	50 (43.1)	12 (10.3)	6 (5.2)	3 (2.6)	105 (90.5)
19.	My experience about hazard risk posed by changes in climate related weather condition make me to overestimate the problem of hazard	32 (27.6)	42 (32.2)	25 (21.6)	15 (12.1)	2 (1.7)	116 (100)
20.	My experience on environmental hazard result to my perception of its risk and willingness to engage for adaptation action	32 (27.6)	48 (41.4)	18 (15.5)	14 (12.1)	2 (1.7)	114 (98.3)
21.	Government and NGOs are perceived to be responsible and able in adapting to climate change	33 (28.4)	42 (36.2)	13 (11.2)	17 (14.7)	10 (8.6)	115 (99.1)
22.	Informing people about uncertainty and climate change impact through media and other means is uncalled for	22 (19.5)	35 (30.1)	29 (25)	17 (14.7)	11 (9.5)	114 (98.3)
23.	To adapt appropriate measures with respect to past, present and future climate hazard, one must perceive that he is at risk	31 (26.7)	47 (40.5)	25 (21.6)	10 (8.6)	3 (2.6)	116 (100)
24.	Climate change impact affect people of other areas in the future not us now	29 (25)	41 (35.3)	8 (6.9)	21 (18.1)	11 (9.5)	110 (94.8)

Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

Department of VScience and Technology Education, Bayero University, Kano.

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25.	Climate system is a divine act, too complex and uncertain for scientists to make useful forecast	24 (20.7)	49 (42.2)	19 (16.4)	16 (13.8)	7 (6)	115 (99.1)
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Table 3 revealed that the majority 48 (41.4%) in item 14 of the respondents strongly agreed with the given definition of climate change, 50 (43.1%) of the respondents agreed with item 17 and 18 respectively and 49 (42.2%) of the respondents agreed with item 25

**Research Question 3:** What is the cause and adaptation strategy of climate change?

To answer this research question data were collected from the respondents and analysed with frequency (F) and simple percentage (%).

**Table 4:** Cause and potential adaptation strategy of Climate Change

S/N	Item	Response					Total
		SA	A	UD	D	SD	
31	Climate changes are humanly induced such burning of fossil fuels, deforestation, immoralities, environmental pollution	52 (49.8)	41 (35.3)	11 (9.3)	6 (5.2)	4 (3.4)	114 (98.3)
32.	Climate changes are divine acts hence cannot be forecast by scientists, eg drought, floods, acid rains, gas eruptions	22 (19.0)	53 (45.7)	17 (14.6)	15 (12.9)	6 (5.2)	113 (97.4)
33.	Climate changes are both humanly induced and natural	30 (25.9)	55 (47.4)	12 (10.3)	5 (4.3)	1 (0.9)	103 (88.8)
34.	Government, scientists and Individuals should invest more efforts in combating climate change	39 (33.6)	51 (44.0)	9 (7.8)	7 (6.0)	2 (1.7)	108 (93.1)
35.	Sensitization program on awareness and willingness to adapt to climate change need to be emphasise by public and private sectors	48 (46.4)	45 (38.8)	12 (10.3)	6 (5.2)	3 (2.6)	114 (98.3)
36.	Employed and unemployed youths and adults must work hard legally to make ends meet	50 (43.1)	46 (39.7)	13 (11.2)	5 (4.3)	1 (0.9)	115 (99.1)
37.	Drastic food production and other agricultural practices would reduce the problems of food insecurity and social instability	40 (34.5)	49 (42.2)	13 (11.2)	4 (3.4)	5 (4.3)	111 (95.7)

Table 4 showed that majority 55 (47.4%) of the respondents agreed with item 33, 51 (44.0%) of the respondents agreed with item 34 and 50 (43.1%) of the respondents strongly agreed with item 36.

**SUMMARY OF THE FINDINGS**

The findings of this study discovered the following:

1. Majority 68 (58.6%) of the respondents strongly agreed that the social impact of climate change is the extreme weather condition which seriously hamper agricultural

production resulting to low quality and quantity of the produces.

2. Majority 48 (41.4%) of the respondents strongly agreed that climate change is changes in climate related weather events or activities. While majority 50 (43.1%) of the respondents respectively agreed that they have adequate knowledge of climate change that help them to explain climate change better and hazard had negative emotional effect since it is perceived as risky and requiring mitigation

Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

Department of VScience and Technology Education, Bayero University, Kano.

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3. Most 55 (47.4%) of the respondents strongly agreed that climate changes are both humanly induced and natural acts. While most 51 (44%) of the respondents agreed that Government, scientists and Individuals should invest more efforts in combating climate change.

### DISCUSSION OF FINDINGS

The extreme weather conditions as climate change factor effect on agricultural activities result in turn to poor harvests is in line with IPCC (2007) observation on the impact of climate change on health, economy and agriculture resource as well as Cline-Cole (2006) contention that climate change had impacts on agricultural economy and individual and group livelihood strategies.

The respondents' public perception of climate change as changes in climate related weather activities is in line with O'Conner, Bord and Fisher (1997) observed that climate change is perceived as heat, floods, acid rain and distant problem affecting other people and times, and Lorenzoni et al (2006) study that perceived climate change as 'rain'.

On the causes of climate change the study also concord with Burton(1997) observations that the causes of climate change is natural (divine) acts and for effective mitigation of the problem as according toSlovic, (1987) people should perceived it risk and require effective adaptation acts.

### CONCLUSION

The study concluded that extreme weather conditions and human induced hazards are perceived as climate changes leading to flooding, low quality and quantity agricultural production, oil spillage, social insecurity and ill-health condition of individuals and groups. Both governments, individual and scientific community should invest more efforts in kinds and funds to address the effect of climate change. Furthermore, the issues of climate change and sustainable environmental management should be incorporated into the General Studies Program (GSP) courses at the undergraduate level and geography and social studies subjects at both the secondary and primary school levels, respectively. If the people are well informed on these issues it would be

easier for the people to key into government plans in mitigating climate change. In addition, it will make the people imbibe positive behavioral changes that would help to save planet earth and achieve sustainable socioeconomic and environmental management.

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Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

Department of VScience and Technology Education, Bayero University, Kano.

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Corresponding author: Garba Shuaibu.

✉ [garba1427@yahoo.com](mailto:garba1427@yahoo.com)

Department of VScience and Technology Education, Bayero University, Kano.

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