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Information Sources and Climate Change Mitigation Support

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Abstract

This study examined the relationship between information sources and support for climate change mitigation among undergraduates at Adeleke University. A simple random sampling technique was used to survey the students anonymously. Data analysis involved descriptive and inferential statistics. Results showed that a majority of the 688 participants expressed support for climate change mitigation actions, such as reducing fossil fuel usage, planting trees, and reducing meat intake. The main sources of climate change information for students were Google, Television, friends, family, Facebook, Radio, YouTube, and Instagram. However, Twitter, newspapers, church/mosque, and religious leaders were not commonly used as primary sources. Notably, sourcing climate change information from newspapers had a significant positive relationship ($p = 0.036$) with support for mitigation measures. The study concluded that information sources play a crucial role in generating support for climate change mitigation efforts. It recommended promoting newspaper readership to enhance awareness and support for sustainable practices, collaborating with newspapers to feature informative climate change content, engaging with Twitter users for accurate information dissemination, and partnering with religious institutions to incorporate climate change messages into teachings and support grassroots initiatives.

Keywords

Information sources, climate change, mitigation, support, Nigeria

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Introduction

Nigeria is widely recognised as Africa's giant, owing to its massive population and economy. It has a population of over 209 million people, making it the most populous country in Africa and the world's largest black nation (Adetayo, 2021b; Victor, 2017). With a gross domestic product (GDP) of \$514.05 billion in 2021, it became the African country with the highest GDP, with petroleum extracted from fossil fuels accounting for a significant portion of its earnings.

Nigeria is transforming as a result of the effects of climate change, particularly, the expanding energy usage occasioned by the activities of its citizens and being experienced in many of its states. This has resulted into the emission of greenhouse gases (GHGs) into the environment thereby generating increased climate change-related concerns from many quarters. The emission of GHGs such as carbon dioxide (CO₂) and methane (CH₄) are causing global warming occasioned by an increase in global temperature. The net effect of which are rising sea levels, floods, associated dangers such as drought and desertification; land degradation; unstable severe weather occurrences; reduced freshwater supplies; and biodiversity loss (Ebele et al., 2016; Adler et al., 2015; Sathre, 2014).

In addition, Sulphur Dioxide (SO₂) emitted during fossil fuel combustions or at industrial facilities contributes to acid rain generation, which massively devastates and reduces agricultural outputs and also has serious repercussions on the health of human beings (Prihatin et al., 2015). The destruction of the ozone layer as a result of fuels burning allows the discharge of dangerous ultra-violet radiations onto the earth's surface which pollutes the environment making it unsafe for living. These rays have been linked to the development of skin and pigmentary cancers (Kawase et al., 2015) and other diseases that can lead to death of millions of people, particularly, children and women (Global Environment Facility, GEF, 2022).

A recent assessment by the World Bank (2019) revealed Nigeria as one of the top ten countries most vulnerable to the adverse effects of climate change, stipulating further that around 6% of its geographical areas are predicted to be exposed to extreme weather occurrences. Reduced streamflow (Akinwumi et al., 2020), among other extremes of climate change in Nigeria has also been recorded. The vegetation in Nigeria's southern sections (predominantly noted for high rainfall) is currently coping with abrupt changes in the sequence of rainfalls. Severe heatwaves are posing major threats to the Savanna vegetation zone. Similarly, there is an attendant risk of losing around 30 hectares of crops each year to desertification in the Sahel area (Ragatoa et al., 2019).

Human actions such as wood burning, fossil fuels combustions, as well as deforestation and wildfire (whether controlled or uncontrolled) have been attributed to adverse climate changes, which resulted to a 50.0% rise in the concentration of

CO₂ and possibly other gases in the atmosphere (IPCC, 2014). The prolonged use of fossil fuels, industrial facilities and poor forest management might double the quantity of CO₂ and other gases in the atmosphere over the next 100 years, assuming natural sinks do not develop at the same rate as emissions. These suggest that Nigeria might need to reduce its reliance on fossil fuels and diversify its economy further to guarantee sustainability at all levels, financial stability inclusive.

According to available statistics, the vast majority (97.0%) of climate experts claimed that human activities are to be blamed for climate change and that meditative steps should be taken to alleviate its impact and advancement (PHI, 2016). There have been heated discussions around minimising the harmful impacts of climate change, which are mostly driven by traditional energy sources (IRENA, 2018). As a result, the worldwide community has worked to keep global warming to a minimum, which is the foundation of the Paris Agreement and COP 26. This Agreement, the result of the Paris Climate Summit in December 2015, aimed to keep the increase in global average temperature well below 2 ° C above pre-industrial levels and to pursue efforts that limit the temperature increase to 1.5 ° C above pre-industrial levels, recognising that doing so would significantly reduce the risks and impacts of climate change (GEF, 2022; UNFCCC, 2015) through climate change mitigation measures.

Climate change mitigation measures include switching from fossil fuel to renewable energy, planting new trees, adapting sustainable transport systems, sustainable uses of lands and forests and reducing meat consumption. Renewables have been demonstrated to not only enhance access to power, but also to encourage growth and employment, with a goal to alleviating poverty and income inequalities (Africa Progress Panel, 2018; Solt, 2016). It is suggested that renewable energy might bring about improved societal advantages in terms of health, education, and gender equality (Wang et al., 2018). Similarly, increasing the number of trees planted and transitioning away from a meat-based diet offer significant advantages.

Governments, particularly, the Nigerian government, must follow through on the resolutions and agreements to reduce GHGs emissions. However, this is not guaranteed because some climate change mitigation commitments lack the necessary detail and political and institutional buy-in to move from a target to concrete implementation (Pauw & Klein, 2020), which is exacerbated by the mix of climate change information people received from different sources. It is on these backgrounds that this study seeks to identify the sources of climate change information, establish undergraduates' level of support for climate change mitigation support, determine challenges to implementation of climate change mitigation efforts and establish the relationship between information sources and

climate change mitigation support among undergraduates of Adeleke University, Nigeria.

Research Questions

1. What are the information sources sourced and exploited by the undergraduates?
2. To what extent do undergraduates support climate change mitigation efforts?
3. What are the challenges faced in implementing climate mitigation measures?

Hypothesis

1. There is a significant relationship between information sources and climate change mitigation support among undergraduates in Adeleke University, Nigeria.

Methodology

The descriptive survey research design of the correlational type was used in the study to distinguish the relevant characteristics of the phenomena of interest. The survey research method is appropriate for this study because it gave an accurate and reliable depiction of how the independent variable (information sources) influences the dependent variable (climate change mitigation support) among Adeleke University undergraduates in Osun State, Nigeria. The study population consisted of 3,457 undergraduate students at Adeleke University. A simple random sampling technique was adopted to select 25% of entire population across all the faculties. As a result, the sample size is 864 students. The study's instrument was a structured questionnaire. The questionnaire underwent a thorough review by an information management expert to assess the face validity of the instrument. Based on valuable suggestions and observations, various sections of the questionnaire were modified to enhance the accuracy of responses from the sample group. As a result of the expert's recommendations, certain items were refined and clarified, while others with similar meaning were eliminated. To ensure its reliability, the instrument underwent validation through a test-retest method. The results indicated an internal consistency of $\alpha = 0.83$, signifying its reliability for practical use. A total of 864 copies of the validated instrument were conducted on the undergraduates and a total of 688 copies of instrument were retrieved, thereby constituting, a response rate of 79.6%. The data collected was organised and analysed using descriptive and inferential statistics. Descriptive statistics such as frequency counts, percentages, mean and standard deviation scores were used to answer the study questions. Furthermore, inferential statistics, specifically multiple regression analysis, were employed to evaluate the single hypothesis formulated for the study.

Result

This section presents the findings of the study. The details are illustrated from Table 1-5.

Table 1: *Demographic information of respondents*

Demographics	Frequency	Percentage
Gender		
Female	410	59.6
Male	278	40.4
Religion		
Christianity	562	81.7
Islam	126	18.3
Age Group		
Less than 16 years	46	6.7
16-20 years	479	69.6
21-25 years	123	17.9
26 & above years	40	5.8
Faculty		
Science	212	30.8
Engineering	71	10.3
Art	33	4.8
Basic and Medical Science	209	30.4
Business and Social Science	162	23.5
Total	688	100.0

The data in Table 1 show that majority of the respondents were female (59.6%) with the Faculties of Science (30.8%) and Basic and Medical Science (30.4%) being the majority. Most are Christians (81.7%) within the age group of 16 - 20 years old (69.9%). The religion is indicative of the university under study, which is a faith-based university owned by a Christian individual. Also, most students in the Nigerian private universities often enrol between the ages of 15 and 20, which is confirmed by the study age group.

Table 2: *Information Sources exploited by Undergraduates*

Information Sources	Yes	No
Google	598(86.9%)	90(13.1%)
Television	502(73.0%)	186(27.0%)
Friends	476(69.2%)	212(30.8%)
Family	467(67.9%)	221(32.1%)
Facebook	382(55.5%)	306(44.5%)

Radio	377(54.8%)	311(45.2%)
YouTube	371(53.9%)	317(46.1%)
Instagram	368(53.5%)	320(46.5%)
Newspapers	330(48.0%)	358(52.0%)
Church/Mosque	323(46.9%)	365(53.1%)
Religious Leaders	296(43.0%)	392(57.0%)
Twitter	193(28.1%)	495(71.9%)

Climate change has been a major occurrence all over the world. Undergraduates in Nigeria are not ignorant of this as they also source information about it. Findings revealed that most undergraduates sourced and exploited information about climate change from Google (86.9%), Television (73.0%), friends (69.2%), family (67.9%), Facebook (55.5%), Radio (54.8%), YouTube (53.9%), and Instagram (53.5%). This result indicates the popularity of Google among the students as they often exploit Google for searching for information. It is not surprising that the undergraduates used the Google to source information about climate change since climate change occurrences are not regular news broadcasted on local news stations.

Table 3: Climate Change Mitigation Support

Climate Change Mitigation	VHE	HE	LE	VLE	Mean	Std. D
Reducing the use of fossil fuels and adapting renewable energy	235 (34.2%)	246 (35.8%)	140 (18.9%)	77 (11.2%)	2.93	0.987
Sustainable uses of land and forest and trees planting	359 (52.2%)	232 (33.7%)	74 (10.8%)	23 (3.3%)	3.35	0.802
Reduction of meat diet	131 (19.0%)	232 (33.7%)	227 (33.0%)	98 (14.2%)	2.58	0.955

VHE, Very High Extent; HE, High Extent; LE, Low Extent; VLE, Very Low Extent; Std. D, standard deviation.

Criterion mean = 2.50, Aggregate mean = 2.95

The high aggregate mean of 2.95, compared to the criterion mean of 2.50, indicates that undergraduates strongly support climate change mitigation efforts. Their level of support surpasses the criterion mean, suggesting a significant commitment to addressing climate change. The undergraduates supported the planting of additional trees, with a mean score (\bar{x} = 3.35; Std. D = 0.802). This suggests that there is a high level of agreement among undergraduates in supporting this effort. This is not surprising given that the majority of students in the study region were from cities where trees are scarce. This might have led to strong support for this mitigating measure. The stoppage of the use of fossil fuels was also supported by the students

(\bar{x} = 2.93, Std. D = 0.987), but there is also more variability in the level of support. This is remarkable given how important fossil fuels are to the country's economy. Reducing meat consumption received the least support, with a mean (\bar{x} = 2.58, Std. D = 0.955). This was also surprising given the importance of meat in the Nigerian cuisine. Though switching from a meat-based to a vegetarian diet appears to be an ambitious mitigation step, it appears to be promising, with slightly above the criterion mean.

Table 4: *Challenges of Implementing Climate Change mitigation measures*

Challenges	Yes	No
Corruption among politicians	550 (79.9%)	138 (20.1%)
Climate change mitigation measures will make Nigeria become poorer	382 (55.6%)	306 (44.4%)
Climate change mitigation measures will increase the cost of living	293 (66.7%)	229 (33.3%)
Climate change mitigation measures gives too much power to government	400 (58.2%)	288 (41.8%)
Lack of technology to make the shift to green energy	509 (74%)	179 (26%)

The findings of the research shed light on the challenges associated with implementing climate change mitigation measures. One prominent challenge highlighted in the study is the presence of corruption among politicians. The overwhelming majority of respondents, comprising 79.9% of the sample, acknowledged that corruption poses a significant obstacle to effective implementation. Another noteworthy concern raised by the respondents is the potential economic impact of climate change mitigation measures on Nigeria. Approximately 55.6% of participants expressed apprehension that such measures might lead to a decline in the country's economic status, potentially resulting in increased poverty.

Furthermore, a significant portion of the respondents, accounting for 66.7%, believed that the implementation of climate change mitigation measures could escalate the cost of living. This perception highlights the apprehension surrounding the potential financial burdens that individuals may face as a result of adopting environmentally friendly practices. Additionally, a considerable number of participants, representing 58.2% of the sample, expressed concerns about the concentration of power in the government resulting from climate change mitigation measures. This finding suggests that individuals worry about the potential implications of such measures on the balance of power and governance.

Lastly, the research identified a lack of technology as a barrier to transitioning to green energy. Specifically, 74% of the respondents acknowledged the absence of adequate technology to facilitate the shift towards sustainable and renewable energy sources, which is crucial for effective climate change mitigation.

Table 5: Information Sources and Climate Change Mitigation Support

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.175 ^a	.031	.013	1.83969		
ANOVA ^b						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	72.371	12	6.031	1.782	.047 ^a
	Residual	2284.507	675	3.384		
	Total	2356.878	687			
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.903	.505		15.644	.000
	Facebook	.020	.165	.005	.122	.903
	Twitter	.097	.176	.024	.552	.581
	Instagram	-.134	.164	-.036	-.816	.415
	YouTube	.053	.169	.014	.316	.752
	TV	.177	.179	.043	.990	.322
	Radio	.261	.167	.070	1.563	.119
	Newspaper	.340	.161	.092	2.104	.036
	Church/Mosque	.258	.192	.070	1.346	.179

	Google	-.270	.225	-.049	-1.198	.231
	Family	-.035	.201	-.009	-.174	.862
	Friends	.058	.195	.014	.294	.769
	Religious Leaders	-.147	.188	-.039	-.785	.433
a. Dependent Variable: Climate Change Mitigation Support						

The overall model (with all predictors included) has a statistically significant relationship with climate change mitigation support among undergraduates in Nigeria, as indicated by the ANOVA results ($F = 1.782$, $p = 0.047$). However, the overall model has a low R-squared value of 0.031, indicating that the predictors explain only a small portion (3.1%) of the variance in climate change mitigation support. Among the individual predictors, only one predictor, namely "Newspaper," has a statistically significant relationship with climate change mitigation support ($p = 0.036$). The positive coefficient of 0.340 suggests that increased exposure to newspapers is associated with higher levels of support for climate change mitigation among undergraduates in Nigeria. The remaining predictors, including Facebook, Twitter, Instagram, YouTube, TV, Radio, Church/Mosque, Google, Family, Friends, and Religious Leaders, do not have statistically significant relationships with climate change mitigation support (all p -values > 0.05).

In summary, the findings suggest that among the various information sources examined, exposure to newspapers is associated with higher levels of support for climate change mitigation among undergraduates in Nigeria. However, the overall predictive power of the model is relatively weak, indicating that other factors not included in the analysis may have a more significant influence on climate change mitigation support among this population.

Discussion

Climate change has become a worldwide phenomenon, and many experts believed that people are mostly to blame. According to the Intergovernmental Panel on Climate Change (IPCC) reports, the majority of the observed extreme events over the last 50 years were likely to have been caused solely by increasing concentrations of GHGs produced by human activities such as deforestation, bush burning, fossil fuel burning, and the release of several other GHGs through industrialisation and urbanisation (IPCC, 2012). Climate change's detrimental repercussions have generated a renewed emphasis on clean and renewable energy sources (Wang et al., 2018). As a result, substituting fossil fuel-based products and energy can help to reduce CO₂ emissions into the environment (Fares et al., 2015). Furthermore, many forest resources are becoming extinct as a result of the effects of climate change

(Onyekuru & Marchant, 2016). The concept of employing forest management to combat climate change was initially proposed in the 1970s. The great potential of forest management in climate change mitigation was recognised and reflected in the Intergovernmental Panel on Climate Change assessments two decades later.

However, the majority of nations continue to get energy mostly from climate change-causing activities such as the burning of fossil fuels (IEA, 2017). As a result of the societal economic implications, getting support for climate change mitigation may be difficult. Evidence suggests that the prospective advantages of climate change mitigation measures such as reduced use of fossil fuels, increased use of renewable energy, sustainable uses of land and forests, planting of new trees, and reduced meat consumption may outweigh the current financial consequences. For example, diets heavy in animal products have been linked to increased GHG emissions (Abbade, 2015), and animal-based foods accounted for the majority of GHG emissions in a typical diet (Hanssen et al., 2017). Vegetarian diets, on the other hand, have the potential to significantly cut GHG emissions (Tilman & Clark, 2015). Dietary changes from animal products, particularly red meat, reduce mortality risk (Aleksandrowicz et al., 2016), and there are general synergies between low-GHG diets and health advantages (Irz et al., 2016). These are just a few potential benefits.

Many people, however, are sceptical that ambitious climate change mitigation policies would get widespread public support. This current study dispels such scepticism by demonstrating that if climate change mitigation measures are enacted, students will support the policies and measures. This conclusion is remarkable in light of the fact that fossil fuels have long been a subject of controversy in Nigeria, which has a long history of corruption. Fossil fuels also generate a significant amount of revenue for the governments, and even the people. It is unclear why students supported limiting the reliance on fossil fuels. Nonetheless, the positive findings given in this study show that there is potential for a practical mitigation strategy that will be supported by the masses down the line.

The support for a meat-free diet is startling, but not entirely unexpected, considering that the institution of study is a faith-based university that adheres to the Adventist education system's ideology of supporting a plant-based diet (Ponder, 2018). Students also supported the growing of new trees, demonstrating that Nigerian cities had a bright future. Many of the students come from places such as Lagos State, where houses are built next to one another and there are few trees. It is not strange that individuals would want trees surrounding the various dwellings after experiencing what it is like to have trees on campus.

The study's findings showed that many students prefer to exploit the climate information needed from the social web. It is not surprising that Google was the

most signified by the undergraduates for exploring and exploiting climate change information. This was followed by the Television, friends, family, Facebook, Radio, YouTube, and Instagram. This findings was supported by the study of Orifah et al (2021) which discovered that the primary sources of climate change information were Radio, family, and friends. Similarly, the findings aligned with Chukwuji et al. (2019) finding which identified Radio as a primary source of climate information. . The use of social media platforms to source climate change information is a confirmation of the popularity of the social media tools among young people who form a majority of the respondents (Adetayo & Williams-Ilemobola, 2021; Auxier & Anderson, 2021) in this study. Twitter was the least source reverted to, to source climate change information. This confirmed the decline of Twitter exploitation among teens (Hughes, 2021). Our findings, however, conflicted with findings of Scott-Parker et al. (2016) which identified religious leaders as a primary source of information about climate change. The findings of Scott-Parker et al. might be due to the fact that religious leaders are typically more trusted when it comes to climate-change messaging than any other group. However, in the current modern era, young people, who make up the bulk of this study, are more inclined to use technology to get information (Adetayo, 2021a).

Furthermore, the source of climate change information is a critical factor in forecasting the approaches that will be used by key authorities for policy creation and execution (Di Falco & Sharma-Khushal, 2019). As a result, the present study discovered that newspaper independently had a strong relationship with support for climate change mitigation efforts. This study underscores the relevance of conventional media when it comes to global news since individuals who obtain information needed from these reliable sources are more inclined to agree with the content. This statement or assertion was in consonance with the findings of Sterret et al. (2018) which discovered that individuals are more inclined to trust what they have a higher level of confidence in.

Despite the students support for climate change mitigation measures, the current study discovered that corruption among the Nigerian politicians is the greatest hindrance to climate change mitigation measures being implemented. This validates the findings of Transparency International, which ranked Nigeria after Guinea-Bissau as the second most corrupt country in West Africa (Uche, 2021). Of the 49 countries assessed in the Sub-Saharan Africa, only 12 are more corrupt than Nigeria. Some years ago, David Cameron, the former Prime Minister of the United Kingdom, was overheard stating at a UK anti-corruption meeting that, "We've got some leaders of some fantastically corrupt countries coming to Britain ..., Nigeria and Afghanistan, possibly the two most corrupt countries in the world" (BBC, 2016).

Despite this, Nigeria still has an abundance of energy resources, both conventional and renewable. It has enough renewable energy resources to suit both the urban and rural Nigerians' electricity demands. However, this study discovered that a lack of technology to make the transition to green energy was also a major factor that might hinder climate change mitigation efforts. The result is self-evident, as Nigeria has not found a solution to the country's electrical issue since its independence in 1960. In keeping with this, Offiong (2019) observed that Nigeria has one of the lowest per capita electricity supply rates in Africa. Many rural populations, in particular, do not have access to electricity. As a result, it is not unexpected that inadequate technology is the second biggest impediment to mitigating climate change. This is supported by Adewuyi (2020), who noted that among the issues highlighted in Nigeria were a lack of access to advanced technologies and high manufacturing costs.

In terms of finance, many individuals, including many economists, have argued that climate change is beyond cost-benefit analysis and that monetary valuing is unethical (Ackerman, 2008). However, because of the enormous degree of poverty in Nigeria, the cost implications cannot be neglected. The cost of halting global warming and reducing net carbon emissions to zero by 2050 will be \$50 trillion (Klebnikov, 2019). This is a large sum that would make reversing climate change much more difficult in a fragile economy like Nigeria. It is not unexpected, however, that the present study discovered that climate change mitigation efforts would cause Nigeria to become poorer and raise the cost of living for the public.

Conclusion

The study concludes that information sources are essential to garnering support for climate change mitigation measures. The findings revealed that students primarily rely on sources such as Google, Television, friends, family, Facebook, Radio, YouTube, and Instagram for climate change information. Among these, Google emerged as the most popular search engine, while Facebook dominated as the preferred social media platform. Furthermore, the study highlighted that friends and family were considered more valuable sources of climate change information compared to churches/mosques and their respective leaders. On the other hand, Twitter, newspapers, church/mosque, and religious leaders were not commonly utilized as primary sources by students. It was also evident that students expressed support for climate change mitigation measures such as reducing fossil fuel usage, embracing renewable energy, consuming less meat, and practicing sustainable land and forest management, including tree planting. The study identified several challenges to implementing climate change mitigation measures in Nigeria, including corruption among politicians, limited technology for a seamless transition to green energy, increased living costs, government authority concerns, and rising poverty levels among citizens.

Consequently, the study proposes the promotion of newspaper readership, particularly among students and the general population, as an avenue for enhancing awareness and support for sustainable practices. Collaborating with newspapers to feature informative and engaging climate change content can play a significant role in educating the public and fostering support. Additionally, engaging with Twitter users through official accounts or partnerships with climate change organizations and experts can facilitate the dissemination of accurate information and active participation in climate change discussions. Collaboration with religious institutions and leaders is also recommended, incorporating climate change messages into religious teachings and sermons, providing training programs and resources, and fostering multi-stakeholder dialogue to bridge the gap between scientific and religious communities. Supporting grassroots initiatives led by religious communities addressing climate change can enhance the credibility and influence of religious leaders.

The implications of this study extend to climate change policymakers and the government, offering valuable insights for developing targeted policies focused on print and broadcast media, including online platforms, to raise awareness, knowledge, and environmental sustainability practices among Nigerians. This research has the potential to inspire the government to adopt ambitious environmental sustainability initiatives and alleviate uncertainty regarding public support for climate change mitigation actions.

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