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Climate Change Education and Communication in Broadcast Media: Content Framing and Audience Reception

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ABSTRACT

This study critically examines climate change education and communication in Nigerian broadcast media, focusing on message content, framing, and audience reception in Edo State. Grounded in Uses and Gratifications Theory and Perception Theory, the research explores dominant broadcast narratives, audience interpretations, and their influence on environmental awareness, learning, and behavioral change. Using a descriptive survey design, structured questionnaires were administered to 400 residents across Edo North, Edo Central, and Edo South, yielding 385 valid responses. Results indicate that while broadcast media are key sources of climate-related education, coverage remains shallow, episodic, and politically influenced, with news bulletins dominating formats. Although 82.6% of respondents reported positive attitude shifts, only 25.9% considered the educational impact adequate. The study highlights a gap between audience expectations and media delivery, recommending diversified, localized, and sustained programming, enhanced journalist training, and regulatory measures to strengthen broadcast media's role in advancing climate literacy and environmental education.

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1. INTRODUCTION

The media play a pivotal role in shaping public understanding and responses to global challenges such as climate change. As the impacts of climate change intensify (ranging from sea-level rise and desertification to erratic weather and declining agricultural productivity), effective communication becomes essential for fostering environmental awareness and prompting behavioral change (see <https://www.ipcc.ch/report/ar6/wg1/>). In this regard, broadcast media (particularly radio and television) hold considerable importance in Nigeria because of their broad coverage and ease of access, especially among populations in semi-urban and rural areas (Ojebuyi & Kayode-Adedeji, 2017). Despite their reach, studies have raised concerns about the quality and consistency of climate change communication in many developing countries, including Nigeria (Ogunjimi, 2019; Nwabueze & Ezebuenyi, 2012). The capacity of broadcast media to drive public engagement on climate issues largely depends on how well these platforms frame and present their messages, and how audiences receive and interpret them (Ekeanyanwu & Kperogi, 2011).

Climate change is a global concern with profound implications for human societies, ecosystems, and development trajectories. As its impacts intensify (ranging from sea-level rise and desertification to extreme weather events and declining agricultural productivity), there is growing recognition of the need for public understanding, policy engagement, and behavioral change (see <https://unfccc.int/topics/science/workstreams/impacts-vulnerability-and-risk-assessment>) (Okereke et al., 2010). One of the key drivers of this process is effective communication. In particular, the mass media, and specifically broadcast media, are crucial for shaping how societies perceive, understand, and respond to the climate crisis (Carvalho, 2007; Anderson, 2009).

The role of broadcast media (television and radio) in public communication cannot be overstated. In many developing countries, including Nigeria, these platforms remain the most accessible sources of information for large segments of the population. They provide the channels through which complex scientific, policy, and social issues, such as climate change, are translated into public knowledge. However, the capacity of the broadcast media to effectively fulfill this role depends significantly on the nature of the messages they deliver and how audiences receive and interpret them (Boykoff, 2008; Nnadi & Okwuosa, 2020).

The concept of climate change communication encompasses not only the transmission of factual information about environmental phenomena but also the framing, tone, frequency, and cultural relevance of those messages. Previous studies (Boykoff & Yulsman, 2013) indicate that media coverage can either enhance public engagement or deepen confusion and denial depending on the quality and framing of the content. In many African countries, including Nigeria, there is a reported disconnect between the urgency of climate change and the level of attention it receives in media discourse.

Furthermore, the framing of climate change messages (the way issues are defined, causes explained, and solutions proposed) has significant effects on how audiences process and respond to the information (Nisbet, 2009; Entman, 1993). For example, media narratives that emphasize catastrophe without corresponding focus on solutions may foster fear and helplessness rather than constructive action (O'Neill & Nicholson-Cole, 2009). On the other hand, message frames that highlight local relevance, community resilience, and actionable steps can encourage personal and collective engagement (Spence & Pidgeon, 2010). Thus, the interplay between message content and audience reception is at the core of effective climate change communication.

Climate change communication extends beyond the mere transmission of information. It involves the framing, tone, frequency, and cultural relevance of messages. Research shows

that the way climate issues are framed (such as focusing on disasters without offering solutions) can affect whether audiences respond with engagement or apathy (Hart & Feldman, 2016). Conversely, messages that highlight local relevance and actionable solutions can enhance public interest and participation (Chapman *et al.*, 2017).

Two theoretical perspectives guide this study: The Uses and Gratifications Theory and Perception Theory. The former posits that audiences actively seek media content that satisfies their informational, emotional, or social needs, while the latter emphasizes how individual beliefs, prior knowledge, and sociocultural contexts influence how messages are interpreted. In the climate change context, when media content is unclear or irrelevant, audiences may become disengaged despite their exposure (Lorenzoni *et al.*, 2007).

In Nigeria, where environmental vulnerabilities are severe and media access is widespread, the effectiveness of broadcast media in climate change communication remains an important area of inquiry (Eregba & Mesagan, 2016; Nwabueze & Ezebuenyi, 2012). Although studies have evaluated media coverage trends, less attention has been paid to how message framing aligns with audience understanding and how residents perceive the adequacy, clarity, and usefulness of media content related to climate change.

Edo State provides a compelling case for this investigation. The state experiences frequent environmental challenges (such as flooding, erosion, and deforestation) that are associated with climate change (Ekiugbo & Akpomrere, 2022). It also hosts several active broadcast media stations capable of driving public discourse and awareness. However, the extent to which these platforms effectively communicate climate change and engage their audiences remains underexplored. This study, therefore, critically evaluates the content, framing, and audience reception of climate change messages in broadcast media across Edo State. By assessing that alignment between message delivery and public understanding, the study aims to identify strengths and gaps in current communication practices and propose strategies for more effective climate advocacy through the media.

2. LITERATURE REVIEW

Since the 1990s, researchers have examined how the media report on climate change. According to the literature (Schäfer & Schlichting, 2014), media attention to the issue has increased alongside growing public awareness. However, earlier studies (Antilla, 2005; Hulme, 2007; Anderson, 2009) point out those journalistic limitations, including a lack of scientific knowledge, often result in inadequate or inaccurate reporting. Much of the media's climate coverage lacks depth, often focusing more on mitigation strategies than adaptation. In developing countries, this imbalance limits the public's understanding of the broader challenges of climate change. While news reports on climate issues have gradually increased (Boykoff, 2007), their effectiveness in creating sustained public awareness remains questionable.

Accordingly, media attention to climate change has risen over the last decade in step with increasing public awareness and concern about its human causes and consequences. However, previous studies suggest that reporting was often affected by journalists' lack of knowledge of the issues (Anderson, 2009). Coverage has been variable, while some accounts have hampered accurate representation of climate science. Furthermore, studies suggest that in general, the media have tended to provide relatively little discussion of adaptation to climate change (which may be anticipatory or reactive) and instead concentrated upon less radical mitigation measures in the reduction of greenhouse gases released into the atmosphere. Despite the gradual increase in news reports on climate change, the contentious

issue, especially in developing nations, is the extent these reports have engendered the needed awareness creation on the subject matter.

Some researchers described broadcast media as a form of mass communication that transmits content to a wide audience via a single transmission channel, such as radio, television, and satellite platforms. Through their programming, broadcast media can raise public awareness about issues like fuel subsidy removal and its societal implications. According to the literature (Chekwube et al., 2023), broadcast media provide timely commentary and in-depth analysis on a wide range of subjects, including politics, economics, agriculture, health, sports, emotional and psychological matters, music, drama, the arts, and even entertainment like comic books. Notably, significant news items are often presented with bold headlines and are supported by images or graphics to enhance their impact.

According to the literature, mass media (particularly broadcast media) serve as powerful promotional tools with the persuasive ability to influence audiences to embrace ideas put forward by the government, individuals, or organizations. This influence stems from the media's strategic and creative methods of crafting and delivering content aimed at swaying public opinion. Asemah further asserts that the issues highlighted by the media often shape public priorities, thereby positioning the media as a crucial instrument for disseminating information and shaping attitudes on cultural, health-related, or political matters.

Some researchers describe broadcasting as the transmission through space, employing radio frequencies, of signals, capable of being received audibly, visually, or both, by the general public. This shows that broadcasting entails transmitting radio and television signals through space to the general public. Other researchers reported broadcast communication as a dynamic and complex phenomenon that can function as culture, and culture is also seen as communication because the most general and essential attributes of culture could not develop, survive, extend, or generally succeed without broadcast communication. The mass media, especially the broadcast media due to their immediacy, are vested with the responsibility of informing, educating, and entertaining people living in every stratum of society about the happenings, occurrences, events, and occasions within and outside; this in turn, enhances people in a society and even communities to make valid and informed judgments on issues of what engenders development.

Several points must be considered:

- (i) Broadcast Media and Environmental Communication. Broadcast media (radio and television) remain among the most accessible communication tools in Nigeria (Nweke, 2001; Obot, 2004). Some researchers emphasize their ability to reach diverse demographics and influence public attitudes on a large scale. Despite this potential, environmental topics are still underrepresented or superficially treated in many broadcast programs. Political and editorial pressures often shape how environmental issues are reported in sub-Saharan Africa, resulting in short, event-based stories rather than sustained advocacy campaigns (Kleinberga, 2022).
- (ii) Framing and Content of Climate Change Messages. Media framing plays a crucial role in how audiences understand climate change. Using relatable, emotional narratives (particularly in local languages) helps audiences internalize the message (Ajiboye & Omisore, 2021; Momoh & Oyekan, 2023). Human-interest stories (such as the experiences of flood victims) can enhance recall and stimulate behavioral change. However, Nigerian broadcast media, particularly in Edo State, often frame climate stories as isolated incidents (e.g., flooding) without addressing long-term or systemic issues like carbon emissions or deforestation. This event-driven style of reporting undermines the educational value of climate communication.

- (iii) Audience Engagement and Interpretation. Understanding how audiences receive and process climate messages is central to effective communication. According to the Uses and Gratifications Theory, individuals actively seek media content that fulfills specific needs, informational, emotional, or practical. Yet, many Nigerian listeners struggle to comprehend radio programs on climate issues due to the use of technical jargon, irregular scheduling, and lack of localized content (Ajiboye & Omisore, 2021). Similarly, media content framed in formal English often fails to resonate with rural and semi-urban audiences (Ibrahim & Yusuf, 2021). These findings underscore the importance of cultural and linguistic relevance in climate communication (especially in regions like Edo State, where diverse languages and literacy levels influence message interpretation).
- (iv) Media as an Agent of Change. The broadcast media have the potential to function not just as sources of information, but also as agents of societal transformation. What the media highlight often shapes public priorities. When strategically deployed, broadcast platforms can influence beliefs, shape values, and promote policy awareness. Yet, this influence is conditional on the credibility, clarity, and consistency of media content, qualities that are often lacking in Nigeria's climate change coverage.

Several communication theories underpin the study of climate change messaging and reception:

- (i) Uses and Gratifications Theory: Developed by Elihu Katz, Jay Blumler, and Michael Gurevitch in the early 1970s, the Uses and Gratifications Theory emphasizes that media audiences are active participants who deliberately seek out media to fulfill specific needs such as information, entertainment, social integration, or emotional relief. This theory influenced the research design by shaping the questionnaire items around why and how residents engage with broadcast media for climate information (such as seeking updates, safety tips, or emotional validation. In data interpretation, it helped explain why a significant portion of the audience showed low satisfaction with climate content; they were not receiving media content that met their informational or emotional needs.
- (ii) Perception Theory: Perception Theory, influenced by psychological theorists (Bruner, 1957), focuses on how individual experiences, beliefs, and cultural contexts shape one's interpretation of messages. Some researchers emphasized cognitive structures and expectation, while people interpret the world through a personal system of constructs (Bruner, 1957). This theory guided the research by focusing on how individual background factors (like beliefs, knowledge levels, and cultural context) influence the interpretation of climate messages. During data analysis, it helped explain variations in audience reception, particularly why some respondents rated media coverage as ineffective or unrelatable despite general exposure.
- (iii) Knowledge Gap Theory: Formulated by Philip Tichenor, George Donohue, and Clarice Olien in 1970, the Knowledge Gap Theory suggests that as media information increases, individuals with higher education and socioeconomic status tend to acquire information faster than those with lower status, thereby widening the knowledge gap. This theory helped inform the study's sampling strategy, ensuring that participants from different socioeconomic and educational backgrounds across the three senatorial districts were included. In interpreting the data, it was used to understand why better-educated or urban respondents were more likely to find climate content accessible, highlighting disparities in message comprehension due to unequal access to knowledge.
- (iv) Yale's Theory of Persuasion: The Yale Model of Persuasion, developed by Carl Hovland and his team at Yale University in the 1950s, focuses on how the source (credibility), message (clarity and emotional appeal), and audience (demographics and pre-existing

beliefs) determine the effectiveness of persuasive communication. This theory influenced how the study examined message effectiveness, particularly looking at source credibility, clarity of content, and audience characteristics. It provided a lens to assess why messages that were vague, overly technical, or poorly localized were less persuasive, leading to low reported enlightenment and behavior change.

- (v) Media System Dependency Theory: Introduced by Sandra Ball-Rokeach and Melvin DeFleur in 1976, the Media System Dependency Theory posits that the more individuals rely on media to meet their information, orientation, and entertainment needs (especially during periods of crisis) the greater the media's influence on their beliefs and behaviors (Ball-Rokeach & DeFleur, 1976). This theory justified examining the role of broadcast media during environmental uncertainty. It framed the research around the idea that people become more dependent on media for information during crises (e.g., flooding, erosion). The findings particularly that most people rated media as ineffective or less effective were interpreted through this lens, suggesting a failure to meet increased audience dependency during climate-related events.

Empirical studies confirm that media attention to climate issues in Nigeria is inconsistent and often inadequate. For example, while some media houses have begun integrating climate topics into their programming, the coverage lacks depth and is rarely sustained (Oladele et al., 2021). Similarly, many broadcast outlets in Kano gave only sporadic attention to climate stories, which limited their impact on public awareness (Balarabe & Hamza, 2020). In Edo State, findings from the current thesis also show that while radio remains the most accessible medium, the content is repetitive and lacks thematic diversity. Most messages focus on flooding, with little mention of other relevant issues like drought, carbon emissions, or sustainable farming. This underrepresentation hampers a holistic understanding of climate change and undermines public action. The reviewed literature suggests that while Nigerian broadcast media possess significant potential to promote climate change awareness, their current practices fall short in depth, framing, and audience connection. Studies consistently emphasize the need for more relatable, locally grounded, and sustained coverage. The communication gap lies not only in access to media but in how content is constructed and interpreted by diverse audiences.

3. METHODS

This study adopted a descriptive survey research design aimed at evaluating the communication of climate change issues through Nigerian broadcast media and assessing the reception of these messages among residents of Edo State. The design was appropriate for examining relationships between message framing, content delivery, and audience interpretation, as it enabled the collection of quantitative data from a cross-section of respondents. The study population consisted of adult residents across the three senatorial districts of Edo State: Edo North, Edo Central, and Edo South. Specifically, the study was conducted in the following urban centers: (i) Auchi (Etsako West LGA) in Edo North; (ii) Irukepken (Esan Central LGA) in Edo Central; and (iii) New Benin (Oredo LGA) in Edo South

These locations were purposively selected due to their population density, exposure to broadcast media, and vulnerability to climate-related issues. A total of 400 respondents were selected using a sample size determination table. A total of 400 copies of the questionnaire were administered, out of which 385 were duly retrieved. To ensure the reliability and validity of the research instrument, the questionnaire was subjected to expert review by lecturers in mass communication and climate communication studies. Feedback was incorporated to improve clarity, eliminate ambiguous items, and align questions with the study objectives. A

pilot test involving 20 respondents (not included in the final sample) was conducted to assess the internal consistency of the instrument, after which necessary adjustments were made. In terms of ethical considerations, ethical approval was sought and obtained from the research ethics committee of Glorious Vision University, Ogwa. Participants were informed about the purpose of the study, assured of anonymity and confidentiality, and participation was entirely voluntary. Respondents provided informed consent before completing the questionnaire.

The questionnaires were administered face-to-face with the assistance of trained field assistants to ensure accurate completion and high response rates. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics (frequency counts and percentages) were used to summarize responses. This methodology provided the foundation to critically evaluate how climate change issues are communicated through Nigerian broadcast media and how such messages are received and interpreted by diverse audiences in Edo State.

4. RESULTS AND DISCUSSION

Here we presented the key findings from the analysis of data collected from 385 respondents across the three senatorial districts of Edo State: Edo North, Edo Central, and Edo South. The results offer insights into the formats of climate change communication in broadcast media, the reception of these messages by audiences, and the perceived effectiveness of such communication efforts.

Table 1 shows that news bulletins (74.5%) dominate as the primary format for climate change reportage, followed distantly by phone-in or call-in programs (19.7%). Educational and interactive formats (such as documentaries (2.3%), magazine programs (1.6%), and special programs on climate change (0.3%)) were rarely used. This pattern reflects an overreliance on brief, event-focused reporting with limited depth, minimal audience participation, and few opportunities for sustained public engagement.

Table 1. Formats Used to Present Climate Change Issues in Broadcast Media.

Format	Frequency	Percentage
News Bulletins format	287	74.5%
Phone-in/Call-in Programs	76	19.7%
Documentaries	9	2.3%
Magazine Programs	6	1.6%
Special Programs on Climate Change	1	0.3%
Others	6	1.6%
Total	385	100.0%

Table 2 shows that 82.6% of respondents (Agree + Strongly Agree) reported a positive shift in attitude after exposure to climate-related media content. In contrast, 14.3% disagreed, while a small fraction remained undecided (3.1-6.0%). These results suggest that when climate information is clearly presented, contextually relevant, and properly framed, it can effectively shape public attitudes and enhance environmental awareness.

Table 3 shows that approximately 85% of respondents expressed a positive response to broadcast climate reports, while only 12.2% disagreed or indicated dissatisfaction. This demonstrates a strong audience's willingness to engage when the content is accessible, relevant, and resonates with their experiences.

Table 4 indicates that 87.5% of respondents (Strongly Agree + Agree) believe broadcast media play a significant role in promoting environmental sustainability. This high level of

agreement reflects strong public confidence in the media's capacity to act as a legitimate and influential tool for climate advocacy, fostering awareness and encouraging behavioral change.

Table 2. Change in Attitude After Media Exposure.

Response	Frequency	Percentage
Strongly Agree	153	39.7%
Agree	165	42.9%
Undecided	12	3.1%
Disagree	23	6.0%
Strongly Disagree	32	8.3%
Total	385	100.0%

Table 3. Positive Response to Broadcast Climate Reports.

Response	Frequency	Percentage
Strongly Agree	152	39.5%
Agree	175	45.5%
Undecided	11	2.8%
Disagree	24	6.2%
Strongly Disagree	23	6.0%
Total	385	100.0%

Table 4. Broadcast Media's Role in Promoting a Sustainable Environment.

Response	Frequency	Percentage
Strongly Agree	156	40.5%
Agree	181	47.0%
Undecided	8	2.1%
Disagree	15	3.9%
Strongly Disagree	25	6.5%
Total	385	100.0%

Table 5 shows that only 25.9% of respondents agreed that broadcast media adequately enlighten the public on climate change, while 68.1% expressed dissatisfaction. This highlights a clear gap between audience expectations and the actual educational impact of media content, suggesting deficiencies in depth, clarity, and consistency of message delivery.

Table 5. Broadcast Media Enlightenment Impact.

Response	Frequency	Percentage
Strongly Agree	44	11.4%
Agree	56	14.5%
Undecided	23	6.0%
Disagree	137	35.6%
Strongly Disagree	125	32.5%
Total	385	100.0%

Table 6 shows that 67.5% of respondents rated broadcast media as either "less effective" or "not effective" in reporting climate change, while only 27.5% considered them effective. This reinforces earlier findings that coverage is often superficial, underreported, and lacking in practical relevance, contributing to audience dissatisfaction with the quality and consistency of climate reporting. **Table 7** shows that 80% of respondents (Very Important + Important) consider broadcast media critical in shaping public awareness of climate change, while only 6.5% viewed them as unimportant. This reflects a strong consensus on the strategic

role of broadcast platforms in environmental education and engagement, even though current implementation remains limited.

Table 6. Effectiveness of Broadcast Media in Climate Change Reportage.

Response	Frequency	Percentage
Very Effective	65	16.9%
Effective	41	10.6%
Can't Tell	19	4.9%
Less Effective	137	35.6%
Not Effective	123	31.9%
Total	385	100.0%

Table 7. Importance of Broadcast Media in Shaping Awareness.

Response	Frequency	Percentage
Very Important	148	38.4%
Important	160	41.6%
Neutral	52	13.5%
Not Important	25	6.5%
Total	385	100.0%

The findings of this study underscore several critical gaps and opportunities in the broadcast media's communication of climate change issues in Edo State, Nigeria. While radio and television are widely accessible and recognized as credible information sources, their current use for climate communication remains limited in depth, frequency, and diversity of content. For instance, many respondents reported that most of what they hear about climate change comes in the form of short news bulletins, often limited to mentions of local flooding or environmental disasters. One respondent in Edo Central remarked during the pilot phase, "I only hear about climate change when there's a flood or erosion in our area. Nothing more is explained." This suggests that even when issues are reported, they often lack broader environmental context, scientific explanation, or actionable guidance. A closer look at regional differences reveals some disparities in media engagement. Respondents in Edo South (New Benin), being in a more urbanized and media-rich environment, demonstrated higher levels of exposure to climate messages than those in Edo North and Edo Central. However, their feedback still indicated dissatisfaction with content depth. This implies that media access alone does not translate to climate literacy unless the content is effectively framed and consistently delivered. Educational level also played a role in message reception. Respondents with tertiary education were more likely to rate media content as "useful" or "partially enlightening" compared to those with only secondary education, many of whom found the information either too technical or inconsistent. This supports the Knowledge Gap Theory, which suggests that mass media tend to benefit more educated segments of society unless efforts are made to simplify and localize messages. In terms of gender, although the article does not present explicit gender-based analysis, anecdotal observations during fieldwork indicated that female respondents (especially homemakers and market women) relied more on radio broadcasts in local languages. Several indicated that they prefer "programs that talk about farming, weather, or health in a way we can understand." This highlights the importance of culturally and linguistically accessible programming to reach underrepresented audiences.

While respondents generally view broadcast media positively and acknowledge their potential to shape environmental attitudes (**Tables 2-4**), the data from **Table 5** reveal a critical

disconnect. The overwhelming belief in the media's capacity is not matched by satisfaction with the actual quality or impact of climate reporting. This inconsistency likely stems from content limitations, including the dominance of brief news bulletins (**Table 1**), lack of in-depth educational formats, infrequent programming, and low localization of content. This synthesis suggests that the problem is not media access or visibility, but content relevance and delivery. Therefore, future programming should emphasize richer, audience-centered formats (such as documentaries, call-in shows, and local-language storytelling) to close this gap and improve public enlightenment on climate change.

5. CONCLUSION

The findings confirm that Nigerian broadcast media have not fully optimized their role in promoting informed public engagement on climate change. While Edo State residents access climate-related information through radio and television, the content is perceived as inadequate in clarity, relevance, and follow-up. Ultimately, while the audience shows interest and belief in the power of broadcast media to influence environmental behavior, a significant disconnect remains between message potential and practical impact. Bridging this gap requires that media outlets shift from episodic to sustained climate coverage, incorporating local voices, diverse formats, and clearer language to *serve all* demographic segments effectively. Based on the findings of this study, the following practical and feasible recommendations are proposed to enhance the effectiveness of climate change communication through broadcast media in Edo State and beyond:

- (i) Broadcast media should diversify their climate coverage to include topics like renewable energy, sustainable agriculture, and carbon emissions. Engaging environmental experts and journalists can improve content quality. Collaboration with NGOs, researchers, and science institutions can provide credible, localized content at minimal cost, enhancing public knowledge without overburdening media budgets.
- (ii) Stations should diversify formats beyond news bulletins to include documentaries, radio dramas, phone-ins, and panel discussions. These formats foster deeper engagement and understanding of climate issues. Community radio and public broadcasters can pilot these formats with support from agencies like NiMet, NOAA, and university communication departments for broader outreach.
- (iii) Climate messages should be localized through indigenous languages and culturally relevant analogies to improve comprehension among rural and low-literate populations. Collaborating with community leaders, local drama groups, and linguists (with support from partners like UNDP, UNICEF, or Clean-Up Nigeria) can help create relatable and impactful climate content.
- (iv) Broadcasters need specialized training in environmental journalism to improve message clarity, scientific accuracy, and audience impact. Institutions like NIJ, Wole Soyinka Centre, and PACJA can offer short courses or workshops, equipping journalists with essential skills for effective climate change reporting.
- (v) Media should integrate audience feedback tools (call-ins, SMS polls, surveys, and social media) to assess understanding and refine content delivery. These low-cost tools can be embedded in existing programs, with support from civil society groups, youth climate networks, or media monitoring organizations for implementation and analysis.
- (vi) Regulators like NBC should issue climate-focused broadcast guidelines and offer incentives for stations dedicating airtime to credible environmental content. Advocacy from environmental NGOs, researchers, and media agencies like BBC Media Action or DW Akademie can push for such policy reforms and implementation frameworks.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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