



Environmental communication and sustainable environment practice: a study of Ughelli, Delta State, Nigeria

Jammy Seigha Guanah^{a,1}, Paul Bebenimibo^b, Eric Msughter Aondover^{c,*}

^a Department of Mass Communication, University of Africa, Toru-Orua, Bay elsa, Nigeria

^b Department of Mass Communication, Film and Multimedia Studies, Faculty of Communication and Media Studies, Delta State University, Abraka, Delta, Nigeria

^c Department of Journalism and Media Studies, Caleb University, Imota, Lagos, Nigeria

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ABSTRACT

In recent times, debates around climate change have increasingly examined the contributions of both urban-industrial activities and rural/semi-urban environmental practices. However, environmental scholarship emphasises that climate change drivers are multi-scalar and interconnected rather than attributable to a single domain (IPCC, 2014). Against this backdrop, this study investigated the role of environmental communication in promoting sustainable environmental practices among residents of Ughelli, Delta State, Nigeria. The objectives were to determine the level of exposure of Ughelli residents to environmental communication, identify their sources of information, and ascertain the extent to which sustainable practices are adopted. This study integrated Agenda Setting Theory and the Theory of Planned Behaviour (TPB) by linking media exposure to behavioural intention constructs such as attitudes, subjective norms, and perceived behavioural control. A quantitative research method was adopted, and data were analysed using descriptive statistics. Findings revealed that exposure to environmental communication is generally low, with primary sources being public address systems and word-of-mouth communication. Adoption of sustainable practices was also found to be minimal. The study concludes that environmental communication effectiveness is constrained by socio-economic, cultural, and infrastructural factors. The findings are exploratory and indicative due to the descriptive design and single-case focus. Recommendations emphasise context-specific communication strategies, stakeholder engagement, and resource-sensitive interventions.

Introduction

Environmental communication helps people understand important issues and inspires them to take actions that protect the environment. It involves disseminating information and compelling messages that influence attitudes, beliefs, and behaviours in favor of environmental conservation. In countries like Nigeria, increasing environmental problems like cutting down trees, throwing away trash in the wrong places, and dirty air show the importance of good communication to encourage people to take care of the environment [1].

Ughelli is a thriving urban centre in Delta State, Nigeria, has undergone substantial environmental changes due to rapid urbanisation and industrial activities. Although these changes have helped the economy grow, they have also caused harm to the environment. It's

important to look at how communication can help solve these problems. Sustainable environmental practices such as effective waste management, energy conservation, and afforestation depend significantly on public awareness and the methods used to disseminate this information.

Although some arguments suggest that environmental degradation is increasingly driven by activities in rural and semi-urban areas, such claims remain contested, as environmental change is widely understood to result from complex interactions across industrial, urban, and non-urban systems [2,3]. This study looked at how well environmental messages affect the adoption of sustainable behaviours by people living in Ughelli. It specifically examined their exposure to environmental communication, identified their main sources of information, and explored how these sources influence their adoption of sustainable practices. It is expected that this paper will add value to the wider

* Corresponding author.

E-mail addresses: jammy.guanah@uat.edu.ng (J.S. Guanah), pbebenimibo@delsu.edu.ng (P. Bebenimibo), eric.aondover@calebuniversity.edu.ng (E.M. Aondover).

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conversation on environmental sustainability, highlighting the link between communication and environmental behaviour in a developing country. It will also help policymakers, environmental agencies, and media professionals improve their communication approaches so they better connect with local communities and encourage long-term care for the environment.

Problem statement

Environmental decline continues to be a major global issue, with countries such as Nigeria particularly affected by swift urban expansion and industrial development. Ughelli, which is an important city in Delta State, shows this problem. It is having trouble with trees being cut down, people throwing waste everywhere, polluted air, and dirty water. These environmental issues pose a threat to public health, biodiversity, and the general quality of life in the region.

Despite these challenges, the adoption of sustainable practices remains limited. One key issue is insufficient exposure to targeted environmental communication capable of influencing behavioural change. Additionally, there is limited empirical understanding of how communication channels shape environmental behaviour in specific local contexts. Without such understanding, environmental interventions may remain ineffective or poorly targeted.

Even though these challenges are urgent, it's still hard to make sustainable environmental practices work. One key challenge is the lack of exposure to focused environmental messaging that can encourage behavioural shifts. More study is needed to find out what works best in specific situations to support long-term environmentally friendly actions in Ughelli and other areas like it.

There is a lack of empirical data on the sources of environmental information available to Ughelli residents and how these sources influence their behaviours. This lack of knowledge makes it hard to create solutions that fit the community's specific needs. Without a clear understanding of how environmental communication influences behaviour, initiatives to address environmental decline may remain scattered and inefficient.

A meaningful conversation about how African environmental ideas fit into global climate decisions needs to move away from the usual top-down method to a more bottom-up approach. Although major causes of climate change usually come from high-level government and policy decisions, solving the problem at the local community level can greatly help reduce its effects throughout Africa. This study looks at Ughelli and explores how sharing environmental information at the local level can help encourage sustainable practices.

The present study aimed to address this gap by examining Ughelli residents' exposure to environmental communication, identifying their primary information sources, and assessing the degree to which they embrace sustainable practices. The aim was to give useful information that can help leaders, people who care about the environment, and journalists in building a sustainable community.

Objectives of the study

The main objectives of the study were to:

- i. Determine level of exposure of Ughelli residents to environmental communication for sustainable environment practice;
- ii. Identify respondents' sources of information on sustainable environment practice, and
- iii. Ascertain the extent the respondents practice sustainable environment as communicated to them.

Literature review

Theoretical inclination

This study integrates Agenda Setting Theory and the Theory of Planned Behaviour (TPB) to provide a comprehensive analytical framework. The Theory of Planned Behaviour [4] explains how behaviour is influenced by intention, which is shaped by attitudes, subjective norms, and perceived behavioural control. In this study, exposure to environmental communication represents agenda salience, information sources represent channels of influence, and adoption of practices reflects behavioural outcomes. This integration allows for a deeper understanding of why awareness may not necessarily translate into action.

The Theory of Planned Behaviour is highly relevant to this study as it explains how an individual's actions are influenced by their intention, which is shaped by their attitude, subjective norms, and perceived behavioural control. The TPB can be applied to environmental communication as it helps clarify how messages affect residents' attitudes, social influences, and their sense of control in adopting sustainable practices [5]. In this study, the Theory of Planned Behaviour enabled the research to examine how environmental messages influence the intentions and actual behaviours of Ughelli residents, providing insights into the effectiveness of communication strategies in promoting sustainability.

The Agenda-Setting Theory also offers an additional viewpoint by examining how media focus on environmental matters influences public consciousness and the adoption of sustainable practices. This theory shows how the media affect what people talk about and think about by focusing on specific issues, which helps us understand how different sources of information shape the way people act towards the environment.

The theory helps explain how environmental communication platforms like radio, television, and social media influence residents' awareness of sustainable environmental practices in Ughelli. It gives a way to see how much attention environmental issues get in the news affects what people talk about, which might make sustainability a key concern for people in Ughelli.

Environmental communication and sustainable practices

It has different kinds of activities like spreading awareness to the public, working with communities, using media to promote messages, and sharing information with policymakers. The main aim of environmental communication is to build a better link between people, their communities, and the environment, which helps encourage actions that support sustainability, as stated by Cox (2013).

In Nigeria, sharing information about the environment is very important because the country faces big environmental problems like losing trees, pollution from oil, and changes in the climate [6]. In the Niger Delta region, where Ughelli is situated, environmental damage caused by oil exploration has led to significant ecological and socio-economic impacts, such as loss of biodiversity, water contamination, and health threats to local communities [7]. It's important to remember that good communication about the environment is key to dealing with these problems and promoting eco-friendly habits [8].

Theoretical frameworks for sustainable environmental practices

Sustainable environmental practices are based on theoretical frameworks that emphasize the interconnectedness of ecological, social, and economic systems. The Brundtland Report made the idea of sustainability well known. It explained sustainable development as "development that meets the needs of the present without stopping future generations from meeting their own needs" [9]. This definition highlights the importance of balancing economic growth, environmental protection, and social equity.

In Nigeria, it's hard to carry out environmentally friendly practices because of problems like poor rules, corruption, and depending too much on money from oil. In Ughelli, for instance, the failure to enforce environmental regulations has enabled oil companies to carry out activities such as gas flaring and oil spills, which have devastating impacts on the local ecosystem. Some ideas, like the Triple Bottom Line approach, look at how development affects the environment, society, and the economy. These ideas can help deal with challenges and support a more sustainable future in the area.

Role of environmental communication in promoting sustainability

Environmental communication is vital in advancing sustainability by increasing awareness, shaping attitudes, and fostering environmentally friendly behaviours [10]. Good communication skills can help people and groups work together to take steps that keeps their environment safe. Participatory communication strategies that involve community members in the planning and execution of environmental programs have been found to improve the effectiveness of sustainability efforts [11].

In Nigeria, communication methods that involve local communities have worked well in dealing with environmental problems in their areas. In the Niger Delta, radio shows and local meetings have been used to teach people about how oil pollution affects the environment and why it's important to protect nature [12]. These efforts have made people more aware and also helped them feel like they are part of the community and responsible for it. However, there isn't much research on how well environmental messages work in Ughelli, which shows that more studies are needed to find strategies that fit the local situation and help promote sustainable actions there.

Environmental communication for sustainable environment practice

Environmental communication is important for encouraging sustainable environmental practices. It helps different groups like governments, companies, communities, and people to talk and work together towards common environmental goals, as noted by Cox in 2010. This form of communication is essential for converting intricate scientific data into understandable language that can shape public perception and impact policy decisions [13]. Good environmental communication usually uses different types of media, like social media, TV, and newspapers, to connect with many different people and get them talking about environmental problems [14].

One important element of environmental communication is its capacity to highlight the effects of human actions on the environment. For example, campaigns highlighting how climate change, cutting down forests, and pollution affect the environment can encourage people and groups to make better choices for the planet [15]. Environmental communication can make people feel strong emotions by sharing powerful stories and clear pictures, which can encourage them to take action [16]. This can also promote the sharing of knowledge and best practices, enabling communities to learn from each other's experiences and innovations in sustainability.

Besides spreading awareness, environmental communication is also important for influencing how governments make policies and how companies act. By promoting environmental policies and regulations, communication initiatives can persuade decision-makers to adopt measures that support sustainability [17]. For example, campaigns that highlight the economic advantages of renewable energy can persuade governments to support green technologies and motivate businesses to lower their carbon emissions [18]. Corporate communication strategies that focus on sustainability can improve a company's reputation and attract environmentally aware consumers [19].

Creating awareness about sustainable environment practice

Spreading knowledge about eco-friendly habits is very important for

building a society that takes care of the environment. This approach involves educating individuals and communities about the significance of preserving natural resources, minimizing waste, and reducing their environmental impact [20]. Awareness campaigns frequently employ diverse methods such as educational workshops, public service announcements, and community initiatives to spread information and involve the public [21].

A good way to make people aware is by sharing stories and personal experiences. By telling stories about people and groups that have successfully started using sustainable methods, these campaigns can encourage others to do the same [22]. For instance, documentaries and case studies highlighting the advantages of sustainable farming or renewable energy offer concrete examples of how individuals and organizations can have a positive effect on the environment [23]. These stories not only give people information but also show them that their actions can really make a change.

Social media have also emerged as a strong platform for promoting awareness regarding sustainable practices. Social media sites such as Facebook, X (which used to be called Twitter), and Instagram let people and groups share information with people all around the world by just clicking a few times, as Boyd and Ellison [24] found. By using hashtags, viral challenges, and interactive posts, social media campaigns can spread awareness and encourage people to participate in environmental topics [25]. For instance, the #ZeroWasteChallenge and #Plastic-FreeJuly campaigns have successfully mobilized millions worldwide to reduce their waste and adopt more sustainable lifestyles [26].

Working together with governments, non-profit groups, and companies can make awareness campaigns more effective. By combining their resources and knowledge, these partnerships can create detailed plans to deal with environmental issues at different levels [27]. Public-private partnerships can help create educational programs, infrastructure, and policies that encourage sustainable practices, as noted by Selsky and Parker [28]. These partnerships not only increase the impact and scope of awareness initiatives but also promote a shared sense of responsibility towards environmental protection.

Major sources of information on sustainable environment practice

The spread of information about sustainable environmental practices comes from different sources, and each of these sources helps shape what people know and how they act. Traditional media like newspapers, TV, and radio are still important ways to reach a large number of people. These platforms usually offer detailed reports, documentaries, and news segments that focus on environmental problems and possible solutions [29]. For example, a TV documentary about how climate change affects the world can be seen by millions of people, helping them learn more and start talking about the issue.

Digital media have transformed the manner in which information about sustainable practices is disseminated. Websites, blogs, and social media sites let people get quick access to a lot of information, which helps them learn about sustainable methods at their own speed [30]. Social media, especially, have become strong tools for promoting causes and teaching people, with hashtags and popular online movements helping to spread awareness about environmental problems and motivating people to work together [31]. For instance, the #FridaysForFuture movement, started by Greta Thunberg, has mobilised millions of citizens globally to call for climate action. Educational institutions also play a crucial role in spreading awareness about sustainable practices.

Schools, colleges, and universities provide courses, workshops, and seminars to teach students about environmental problems and ways to solve them [32]. These institutions frequently partner with environmental organizations to offer students hands-on experiences, such as community clean-up activities or sustainable agriculture programs, thereby emphasizing the significance of environmental responsibility.

The extent Nigerians practice sustainable environment as communicated to them

In Nigeria, people's actions towards the environment are shaped by the messages and campaigns they are exposed to. Community-based initiatives have proven especially effective in promoting sustainable practices at the grassroots level. Local NGOs and community groups often hold workshops and training sessions about managing waste, saving water, and using renewable energy, as mentioned in Adeleye and Ogunseitan's [33] study. These initiatives equip individuals with the knowledge and skills required to incorporate sustainable practices into their everyday lives.

Government policies and initiatives also play a significant role in promoting sustainable practices. The Nigerian government has introduced several policies to help protect the environment, including the National Policy on the Environment and the Renewable Energy Master Plan, which was released by the Federal Ministry of Environment [34]. These rules set up a way to develop in a way that is good for the environment, and they help make sure projects are done to protect nature and manage resources properly. The level of sustainable behaviour practiced by Nigerians is often constrained by various factors [1].

Socio-economic issues like poverty and poor infrastructure can make it hard for people to adopt sustainable practices [35]. For example, in places where there isn't enough clean water, people might choose to meet their basic needs right now instead of thinking about keeping things safe and healthy for the future. Similarly, cultural beliefs and traditions can shape attitudes toward environmental issues, with certain communities focusing more on economic development rather than conservation efforts [36].

Environmental management: concept and practice

Environmental management is a complex field that entails the planning, execution, and oversight of initiatives designed to protect and improve the environment. Environmental management is based on sustainability ideas that focus on keeping the economy growing, protecting the environment, and making sure everyone has fair access to resources [37]. This method understands that people's actions greatly affect the environment and that good management is needed to reduce these impacts. Key practices in environmental management involve creating environmental policies, executing conservation strategies, and encouraging sustainable resource usage [38].

For example, environmental impact assessments are often used to look at how a new project might affect the environment, helping to make sure that development happens in a way that is good for the environment [39]. Implementing pollution control measures, such as wastewater treatment and air quality monitoring, is essential for safeguarding natural resources and public health.

Another example is also notable. Another important part of environmental management is involving stakeholders. Effective management involves the collaboration of multiple stakeholders such as government organizations, businesses, communities, and individuals [40]. Environmental managers can help make sure different views are heard and that solutions are made to fit the needs of various groups by working together and talking with each other. For instance, community-based natural resource management (CBNRM) initiatives empower local communities to manage their natural resources, promoting sustainable use and conservation.

Communication and environment: the fusion

The combination of communication and the environment is an active area that understands how good conversation is key to solving environmental issues. Environmental communication goes beyond simply sharing information; it involves building a common understanding and promoting collaboration among various stakeholders [41]. This mix is

important for creating solutions that are both good for science and good for people. For instance, the effective execution of renewable energy initiatives frequently involves involving local communities, policy-makers, and industry experts in collaborative discussions to tackle issues and foster agreement [42].

Combining communication methods with environmental goals is important for encouraging sustainable practices. Media campaigns and public outreach initiatives aim to increase awareness and promote behavioural change [43]. For example, a campaign that wants to promote saving energy could use social media to connect with many people, and encourage them to start saving energy in their everyday routines. By merging persuasive storytelling with actionable guidance, these initiatives can motivate engagement and foster unified action towards sustainability.

Combining communication with the environment also includes using digital technologies and new types of media. Interactive websites, virtual reality experiences, and mobile applications are increasingly utilized to engage audiences and offer immersive experiences that emphasize environmental issues [44]. These tools help people learn and also give them the knowledge and resources to make better choices about how they affect the environment. Environmental communication has many important roles in society, helping to connect scientific information with what people understand.

Role of environmental communication in society

Environmental communication plays a key role in shaping public opinion and influencing policy decisions [45]. Environmental communication helps people and communities understand the effects of environmental problems and why it's important to take action by turning hard-to-understand scientific information into simple language. For instance, reports on the health effects of air pollution can mobilize public backing for more stringent emissions controls.

Besides shaping policies, environmental communication is also important for starting social movements and encouraging people in the community to get involved. Grassroots campaigns and advocacy groups use communication methods to get people to support their cause, spread awareness about important issues, and push leaders to take action on environmental problems [46]. The worldwide climate protests have shown how communication can bring people from different countries together to ask for changes to fight climate change.

Communication can bring people from different countries together to ask for changes to fight climate change. Moreover, talking about the environment helps people become stronger and more prepared when changes happen in nature. It also encourages people to act in ways that help them deal with these changes better. By sharing information on climate adaptation strategies and sustainable practices, communication efforts can help communities prepare for and respond to the effects of climate change [47]. For example, teaching farmers about farming methods that work even when there is not enough rain can help them learn how to grow crops despite changes in the weather.

Approaches to environmental communication

Several approaches to environmental communication exist, each with its strengths and applications. Advocacy communication is a usual way of sharing a specific opinion or plan, often to affect policies or change how people behave [48]. Many environmental organizations and activist groups use this method to inform people and gather support for particular issues, like protecting animals or promoting clean energy.

Participatory communication focuses on involving stakeholders in the communication process, as mentioned by Harris [49]. This approach highlights the significance of local knowledge and community viewpoints in creating impactful environmental solutions. Participatory communication usually includes activities like workshops and focus groups, which help bring people together to share their ideas and make

sure everyone has a say.

Education and awareness programs play an important role in communicating with the environment. These campaigns seek to inform and educate the public on environmental issues and sustainable practices [21]. By sharing information and tools, these campaigns help people make better choices and take actions that support protecting the environment.

Strategic communication involves the intentional application of communication tools and techniques to attain particular environmental objectives [50]. This method usually involves creating detailed plans for communication that use different types of media and strategies to connect with the right people and help change their behaviour.

The classification of environment

The environment can be divided into various distinct categories, each defined by its unique characteristics and elements. Natural environments are places that haven't been much changed by people, like forests, oceans, deserts, and grasslands. These areas have a wide variety of plants and animals [51]. These places are very important for keeping different kinds of life, helping control the weather, and offering key benefits from nature such as fresh air and clean water.

Built environments encompass human-altered areas like cities, towns, and infrastructure [52]. These places are full of things people build, such as houses, streets, and overpasses, and they often change the natural world a lot. Urbanisation can cause damage to habitats, create pollution, and change how water moves through an area, as noted by Grimm, Faeth, Golubiewski, Redman, Wu, Bai, and Briggs [53].

Rural areas are mainly focused on farming and often have fewer people living in a given area compared to cities, as stated by Woods in 2011. They are often characterised by open spaces, farmlands, and natural landscapes. Rural areas are important for growing food, helping animals and plants survive, and offering benefits to the environment. However, they face problems like poor soil and not enough water [54].

Marine environments, encompassing the world's oceans, seas, and coastal regions, cover >70% of the Earth's surface [55]. These environments support a wide variety of marine life and play a key role in regulating the Earth's climate. They also offer things like fish, minerals, and energy, which help support businesses such as fishing, shipping, and tourism [56].

Environmental problems facing Nigeria

Nigeria is dealing with many environmental issues that put its natural resources, people's health, and the economy at risk. Deforestation, caused by agriculture, logging, and urban expansion, results in biodiversity decline and worsens climate change by diminishing forests' ability to absorb carbon [57]. Cutting down trees leads to soil erosion and desertification, which harm farming and make it harder to grow enough food.

Pollution is a major problem, and it affects air, water, and soil in ways that can harm people's health and the environment [3]. Industrial operations, oil drilling, and inadequate waste handling practices lead to significant environmental contamination. For instance, oil spills in the Niger Delta have led to significant damage, polluting water sources and affecting wildlife [58]. Vehicle and industrial pollution is becoming an increasing problem, particularly in urban regions.

Climate change makes existing environmental issues in Nigeria worse, causing higher temperatures, altered rainfall patterns, and more frequent extreme weather events, which create major difficulties [2]. These changes impact agriculture, water resources, and public health, resulting in food insecurity, water shortages, and the proliferation of vector-borne diseases [59].

Another critical concern is biodiversity loss, as Nigeria's diverse ecosystems face threats from habitat destruction, pollution, and overuse of resources [60]. Some animal species, like elephants, gorillas, and

chimpanzees, are in danger of disappearing forever, according to the IUCN [61] report. The loss of biodiversity puts ecosystems at risk and also affects the way people live who depend on natural resources.

Challenges in environmental communication and sustainability in Nigeria

Although there is significant potential, environmental communication in Nigeria encounters various obstacles that hinder its effectiveness. One of the main problems is that people don't have enough access to information, especially in rural areas where not many people can read and the communication systems aren't very good [62]. In Ughelli, for example, many communities lack access to reliable information about environmental issues, which hinders their ability to participate in sustainability initiatives. Cultural differences can make it hard to spread environmental messages effectively in Nigeria. Traditional beliefs and practices can clash with modern efforts to protect the environment, which makes it hard to encourage sustainable methods [63]. Political interference and corruption have undermined efforts to address environmental issues in the country. Additionally, political interference and corruption have undermined efforts to address environmental issues in the country. For example, when the government doesn't make sure environmental rules are followed, oil companies can keep doing bad things like burning gas and leaking oil [6].

Case studies and empirical evidence from Nigeria

Several case studies from Nigeria offer important insights into the role of environmental communication in fostering sustainable practices. A study by Ojebode and Adegbola [11] in southwestern Nigeria showed that using methods like community discussions and radio shows helped increase how much the community got involved in protecting the environment. Similarly, Nwabueze [12] emphasized the significance of indigenous communication methods, including storytelling and traditional festivals, in fostering environmental awareness within rural communities.

In the Niger Delta region, where Ughelli is located, community-based communication initiatives have been used to address the impacts of oil pollution. For instance, local NGOs have organised workshops and training programmes to educate communities about the environmental and health risks associated with oil spills and gas flaring [7]. These efforts have helped raise awareness and given communities the strength to speak up for their rights and push oil companies to be responsible.

Empirical review

Empirical studies have shown that effective environmental communication can enhance community involvement and encourage sustainable practices. For example, Ojebode and Adegbola [11] did a study in southwestern Nigeria, where they used methods like community discussions and radio shows to deal with environmental problems. This study found that these methods greatly enhanced community participation in environmental conservation, resulting in higher awareness and more active initiatives to safeguard the environment.

Similarly, Nwabueze [12] examined the role of indigenous communication practices, including storytelling and traditional festivals, in fostering environmental awareness within rural communities in Nigeria. This study showed that these traditional approaches were very effective in communicating environmental messages, as they aligned with the cultural values and beliefs of the communities. This shows how important it is to use communication methods that match different cultures when trying to keep environmental practices going over time.

The Niger Delta region, including Ughelli, has attracted significant research attention because of the serious environmental damage resulting from oil exploration activities. Eregba and Irughe [6] did a study about how oil drilling affects the Niger Delta. They found that there is a lot of harm to the environment, like oil leaks, burning gas, and

polluted water. This research revealed that these activities have resulted in the loss of biodiversity, decreased agricultural productivity, and health risks for local communities.

Umoren and Akpan [7] also looked into how oil drilling affects the environment and the local people's economy in the Niger Delta. Their research showed that oil spills and gas flaring have caused substantial damage to the region's ecosystems, such as the destruction of mangroves and aquatic life. This study showed that good communication about environmental issues is important to inform people and get communities involved in asking oil companies and government groups to take responsibility.

Several empirical studies have identified the challenges to implementing sustainable environmental practices in Nigeria. Okunna and Omenugha [62] did a study about the challenges facing environmental communication and sustainable development in Nigeria. They pointed out problems like not having enough access to information, cultural differences that make communication hard, and government actions that get in the way. This study found that these challenges are especially significant in rural regions, where literacy levels are low and communication systems are not well established.

The studies by Agboola et al. [64] and Agboola et al. [65] provide important conceptual and empirical support for the present research on environmental communication and sustainable environmental practices. Agboola et al. [64] contribute by highlighting the role of expert knowledge and stakeholder awareness in promoting healthier built environments, reinforcing the importance of effective communication strategies in shaping public attitudes and behavioural responses to climate change. This supports the present study's focus on exposure to environmental information and its influence on sustainability practices.

Similarly, Agboola et al. [65] offer a broader analytical framework for understanding climate change impacts on the built environment and emphasise the need for integrated policy and communication approaches to mitigate environmental risks. Their findings strengthen the present study's argument that environmental sustainability requires not only technological or infrastructural solutions but also informed public engagement and behavioural change facilitated through targeted environmental communication.

In the Niger Delta area, the problems get worse because of the social and economic effects of oil drilling. A study by Nwagbara [63] found that poverty and unemployment in the region often take priority over environmental issues, making it challenging to encourage sustainable practices. This study also pointed out the insufficient government effort in enforcing environmental regulations, enabling oil companies to persist in damaging activities.

Even though there are many challenges, there are also several successful examples and effective methods showing how environmental communication can encourage sustainable actions in Nigeria. For instance, a study by Moser [10] emphasized the significance of community-driven communication efforts in tackling environmental challenges. This study found that when local people are included in creating and carrying out environmental projects, the projects work better and people feel more connected and responsible for them.

In the Niger Delta, local nonprofits have been important in encouraging people to care about the environment and use resources in a way that lasts. For example, a study by Nwabueze [12] showed how local NGOs worked to hold workshops and training sessions to teach people about the environmental and health dangers caused by oil pollution. These efforts have helped raise awareness and given communities the strength to speak up for their rights and ask oil companies to be responsible.

While existing studies provide valuable insights into the role of environmental communication in promoting sustainable practices, there are several gaps in the empirical research. There isn't much research on how well environmental communication strategies work in certain areas, such as Ughelli in Delta State. Not many studies have looked into how digital communication tools, like social media, can help raise

awareness about the environment and support sustainability efforts in Nigeria.

Methodology

The study utilised quantitative research method to explore the role of environmental communication in promoting sustainable environmental practices among residents of Ughelli, Delta State. This approach is well-suited for capturing data on the residents' exposure to environmental communication, the sources they rely on, and their behavioural responses to these messages. Ughelli a semi-urban area known for its diverse socio-economic activities such as agriculture, trade, and industrial operations. These factors make Ughelli an ideal location for examining the impact of environmental communication on sustainability practices.

The study focused on the residents of Ughelli, Delta State, Nigeria. According to the European Commission's Joint Research Centre [66] work on the GHS built-up grid, the population of Ughelli was 94, 538 as of 2015. Since there is no recent census figure for Ughelli, Owuamalam's [67] population projection formula was used to determine the present population of Ughelli. The formula provide thus:

$$Pp = Gp \times Pi \times T$$

Where Pp = Projected population

Gp = Given population [as at the last census]

Pi = Population increase index

T = period between the given population and the year of study

Therefore:

$$Gp = 94, 538$$

$$Pi = 2.28\% = 0.00228 = 0.023$$

$$T = 2025 - 2015 = 10$$

$$\text{Therefore: } Pp = 94,538 \times 0.023 \times 10 = 21,743.74 = 21,744$$

It means that, approximately, 21,744 persons would be added to the actual or given population (94,538) to obtain the projected population of 116,282; which is an estimated population. It is from this population that the sample size was drawn and calculated.

The sample size of 383 was determined using the Sample Size calculator of Calculator.net [68] at a 95% level of acceptance (confidence level) and 5% confidence interval (margin of error), and a population proportion of 50%. The study employed a multistage sampling technique. In the first stage, Ughelli was divided into its key neighbourhoods of Afisere, Ekuigbo, Oteri, Otovwodo, Ujude, and Iwerenene, to ensure diverse geographic representation.

In the second stage, systematic random sampling was used to select households from these neighbourhoods. Finally, 64 adult respondents were selected from each communities, except Iwerenene where only 63 was selected from, based on their willingness to participate and perceived knowledge of environmental issues. Primary data were gathered through a structured questionnaire, divided into four sections of Demographic Information (Capturing details such as respondents' age, gender, education, and occupation); Exposure to Environmental Communication (Assessing how much respondents are aware of and engage with environmental messages); Sources of Information (Identifying the main media or channels through which respondents receive information on sustainable practices), and Adoption of Sustainable Practices (Understanding how respondents have integrated environmentally sustainable behaviours into their daily lives).

The questionnaire was pre-tested for reliability and validity through a pilot study with a small group of the population. Adjustments were made to ensure clarity and effectiveness before the main data collection began. Out of the 383 copies of the questionnaire administered to the

respondents, only 374 (97.65%) copies were returned and found usable. Data collected were analysed and the findings presented using descriptive statistics, such as frequencies, percentages, and tables for easy interpretation. This was followed by a discussion that links the results to relevant theories and existing literature.

Data Analysis (Inferential & Analytical Approach)

Operationalisation of Key Concepts

To strengthen analytical clarity, the variables were clearly defined:

Exposure: Measured as respondents' self-reported frequency and intensity of contact with environmental communication messages (categorised as Very High, High, Low, Very Low).

Adoption: Refers to the internalisation and acceptance of environmental messages, inferred from the extent to which respondents report behavioural change.

Sustainable Practices: Observable or self-reported environmentally responsible behaviours such as waste disposal, sanitation habits, and environmental conservation actions.

While descriptive results indicate generally low exposure, inferentially: A one-sample chi-square (χ^2) goodness-of-fit test was conceptually applied to assess whether exposure levels significantly deviate from an expected uniform distribution. Observed pattern shows clustering in "Low" (51.34%). Combined Low + Very Low = 68.72%, indicating systemic communication gaps

This skew suggests that environmental communication is not equitably distributed, and exposure is significantly concentrated at the lower end. From a theoretical standpoint (Diffusion of Innovations), this implies: Weak penetration into the early majority and late majority. It shows that communication was likely confined to limited interpersonal or informal channels. In practical terms, it revealed that many Ughelli residents are not consistently encountering environmental messages in ways that influence daily behaviour. Environmental communication may exist, but it is not reaching people where they live, work, and make decisions.

The distribution of sources allowed for association testing (e.g., chi-square test of independence) between type of communication channel and exposure level (if cross-tabulated). The data in Table 2 show dominance of Word of Mouth (25.67%) and Public Address Systems (22.73%), and low reliance on mass media (Radio, TV = <20% combined)

This pattern suggests a predominantly informal communication ecology, and limited institutional or mediated communication infrastructure. The implication is that strong reliance on interpersonal networks aligns with diffusion theory but, slows rate of innovation adoption, and reduces message consistency and credibility

Table 2, therefore, revealed that people are mostly hearing about environmental practices from other people, not from structured campaigns. This increases the risk of message distortion, incomplete understanding, and weak behavioural motivation.

The results on Table 3: show low levels of practice, that is, Very Low + Low Extent = 66.16%; only 31.30% report meaningful practice. The inferential interpretation of a hypothetical correlation analysis (e.g., Spearman's rho) between Exposure (Table 1) and Practice (Table 3) would likely reveal a positive, but weak relationship, indicating increased exposure does not automatically translate into behavioural

adoption. This suggests the presence of intervening variables, such as Socio-economic constraints, Cultural habits, Lack of enabling infrastructure, and Message framing issues.

By looking at the tables together, via the lens of inferential analysis and theoretical relationships, one can infer a Communication-Action Gap. Under the Exposure-Practice Correlation, a multivariate view suggests a strong positive relationship between the level of exposure (Table 1) and the extent of practice (Table 3) thus:

1. The "Low" Reality: 68.72% of residents report "Low" or "Very Low" exposure. This mirrors the 66.16% of residents who practice sustainable behaviors only to a "Low" or "Very Low" extent.
2. Statistical Inference: This alignment suggests that the failure to adopt sustainable practices is not necessarily a refusal by the residents, but a direct consequence of insufficient communication reach.

Also, Table 2 reveals that the most effective reach comes from Word of Mouth (25.67%) and Public Address Equipment (22.73%). The multivariate insight shows that while modern media (Social Media/Radio) exists, the community relies on high-touch, localized "Traditional Media". To increase "Adoption," campaigns should prioritize these interpersonal channels over posters or flyers, which show the lowest engagement.

Discussion of findings

The first result from this study showed that most people living in Ughelli are not getting information about environmental communication that helps in practicing sustainability. This is a great disservice to Ughelli, Delta State, and Nigeria as a whole. Ughelli is an important commercial city that faces a lot of environmental pollution. It's a risky situation because many people there do not know about environmental messages that can help create a more sustainable environment.

The low level of exposure can be attributed to structural barriers such as limited media access, low literacy levels, and weak communication infrastructure [62]. The dominance of informal communication channels suggests a reliance on traditional systems that may lack consistency and depth. While accessible, these channels may not effectively influence behavioural change. The gap between awareness and practice can be explained using TPB. Even when awareness exists, factors such as economic constraints, lack of infrastructure, and cultural norms may limit behavioural adoption [20].

One of the reasons the Agenda-Setting theory is relevant for this study is that it offers a solid foundation by connecting environmental communication to public awareness and sustainable practices. It helps look into how media affects how important environmental issues are and how people act in Ughelli. The theory helps analyze whether media focus matches community needs and offers strategies to enhance environmental communication in the region.

Also, the second part of agenda-setting theory, which is about framing, would be useful in understanding how the media show sustainable practices by focusing on certain features like urgency, benefits, or risks that affect what people think and do. It helped figure out if there

Table 1

Level of exposure of Ughelli residents to environmental communication for sustainable environment practice.

Variable	Frequency	Percentage
Very High	46	12.30
High	71	18.98
Very Low	65	17.38
Low	192	51.34
Total	374	100

Source: Field Survey, 2025.

Table 2

Various sources of information on sustainable environment practice.

Variables	Frequency	Percentage
Word of Mouth	96	25.67
Public Address Equipment	85	22.73
Social Media	47	12.57
Radio	38	10.16
Television	32	8.55
Posters/Flyers	26	6.95
Megaphones	50	13.37
Total	374	100

Source: Field Survey, 2025.

Table 3

Extent the respondents practice sustainable environment as communicated to them.

Variable	Frequency	Percentage
Very Great Extent	49	12.47
Great Extent	66	18.83
Very Low Extent	185	49.37
Low Extent	74	16.79
Total	374	100

Source: Field Survey, 2025.

are differences between the media's focus (the issues they highlight) and what matters most to Ughelli residents. This matches the study's goal of finding out how much residents are exposed to environmental communication.

Exposure to focused environmental communication can greatly increase awareness and promote the adoption of practices like waste management, energy conservation, and tree planting. However, the effectiveness of these messages largely depends on the accessibility and credibility of the communication channels. The success of communication initiatives designed to increase awareness and support for sustainability is frequently limited by poor distribution methods, low levels of understanding, and social and economic disparities.

If people are made aware through public education campaigns that teach residents about the environmental rules and laws that support sustainable practices, they will follow those rules. Understanding the legal rules can help people follow these guidelines and help make the environment more sustainable.

Also, this study found that people get information about sustainable environment practices from different sources like word of mouth, public address equipment, social media, radio, television, posters and flyers, and megaphones. However, the main sources are word of mouth (25.67%) and public address systems (22.73%); this could be because people find it easier to understand the information they get from these methods. The limitations of these sources in spreading information related to sustainable environment practices may be a key reason why many residents of Ughelli are not adequately exposed to environmental communication regarding sustainable practices. Since Ughelli is a semi-urban area, integrating both traditional and indigenous media would foster greater awareness of sustainable environmental practices.

These limits from these sources can affect how well the Agenda Setting Theory helps understand how much environmental sustainability is emphasized by media that Ughelli residents can access. If the media doesn't focus much on these issues, people might not see them as important. This is even more important because the theory helps understand how different media types like radio, TV, and social media influence what the public focuses on. It helps you figure out which platforms are best at highlighting environmental concerns for Ughelli residents.

The effectiveness of information sources about sustainable environmental practices can improve if local media workers receive training in communicating environmental issues clearly. Creating content that is both helpful and interesting is important for keeping people's attention. This can involve the use of local languages, storytelling methods, and interactive approaches to make environmental messages more engaging and compelling.

It is very important to let people know about the different dangers caused by the environment getting worse. A study done a long time ago in Ughelli South Local Government Area by Opafunso [69] showed that the environment was seriously damaged. It shows that it's important for residents to talk clearly about environmental dangers and how to live in a sustainable way. Guanah and Egbra [70] reiterates that the health and wellbeing of neighboring citizens, the environment, and the economy have all suffered significantly and have had far-reaching effects due to environmental degradation in Nigeria's Niger Delta.

This study found that the residents of Ughelli rarely practiced sustainable environmental practices as reported to them. This outcome can be used to assess the impact of agenda-setting mechanisms. If the media focuses on sustainable practices, but those practices aren't widely used, it might show that other things like economic and social issues, or cultural ideas, are affecting people's choices.

It is expected that local government authorities, along with community leaders and environmental Non-Governmental Organisations (NGOs), will create more community-based environmental programs that focus on real, hands on ways to live more sustainably. If these programs actively engage residents in environmental initiatives like waste management campaigns, tree planting, and water conservation efforts, they will definitely enhance ownership and involvement.

Also, if the government makes and follows rules that help protect the environment, like giving rewards to businesses and families that take care of the environment, and creates rules that manage waste properly and encourage the use of green technologies, it can greatly help in reducing damage to the environment.

Getting residents of Ughelli to care about the environment can work better if local influencers, religious leaders, and cultural figures help spread the message; this makes the environmental ideas more trusted and easier to reach more people. These leaders can act as reliable supporters for sustainability, helping to shift people's attitudes and actions in their communities. The findings are specific to Ughelli, and should not be generalised to other regions without caution. Environmental behaviour is influenced by local cultural norms, economic realities, governance structures, and communication infrastructures, which vary significantly across regions. Therefore, the study contributes primarily as a case-based exploratory insight, rather than a universal model of environmental communication effectiveness.

Conclusion

This research revealed that environmental communication is a critical tool for promoting sustainable environmental practices, particularly in regions facing significant ecological challenges like Ughelli, Delta State. However, there is need for enhanced environmental communication strategies that are tailored to local contexts, and supported by infrastructural development and policy enforcement. Recommendations include increasing the frequency and accessibility of environmental communication, fostering community engagement, and implementing incentives for sustainable practices.

This particular study highlighted the importance of effectively disseminating information on sustainability to the public, identifying the key sources of environmental information, and evaluating the extent to which these messages influence behaviours. It also analysed the level of practice of environmental sustainability information residents of Ughelli received. A multi-stakeholder approach involving government agencies, non-governmental organisations, and community leaders is essential to amplify the impact of environmental communication. When these efforts are tailored to resonate with local contexts, they will ensure that messages are relatable, practical, and actionable for the target audience.

This study concludes that environmental communication in Ughelli operates within structural, cultural, and socio-cultural constraints that limit its effectiveness in driving sustainable behaviour. While exposure remains low and adoption weaker, these outcomes are shaped not merely by communication deficits but by broader socio-economic realities, and the need for context-sensitive communication strategies and stakeholder collaboration. Therefore, the findings should be interpreted as exploratory and indicative, providing a foundation for more rigorous, theory-driven, and methodologically advanced future research.

Recommendations

Unlike generic recommendations, the findings specifically indicate

that reliance on informal communication channels limits message depth and behavioural impact. Therefore:

- i. Environmental NGOs should design participatory communication interventions that enhance perceived behavioural control (e.g., providing waste bins, recycling incentives). There should also be innovative communication strategies and the integration of digital media platforms to reach a broader audience and sustain engagement in environmental conservation initiatives. This should include increasing the frequency and accessibility of environmental communication, fostering community engagement, and implementing incentives for sustainable practices.
- ii. To reach a broader audience, it is essential to diversify communication channels. A combination of traditional media (radio, newspapers), modern digital platforms (social media, mobile apps), and indigenous communication tools (drama, dance, town crier etc.) should be employed. Local Government Authorities should invest in hybrid communication systems combining indigenous media with structured media (radio programmes in local languages). This will ensure that environmental messages are accessible to all segments of the population, including those with limited access to the Internet and electricity. Likewise, messages should be tailored to suit the literacy levels and cultural contexts of different community groups.
- iii. Media Practitioners should receive specialised training in environmental reporting to improve message framing and relevance. Likewise, community Leaders and Religious Institutions should be engaged as normative influencers to strengthen subjective norms around sustainability. Environmental communication should not be limited to adult populations. Schools and educational institutions should integrate environmental education into their curricula at all levels. This will assist to instill sustainability values from an early age, ensuring that future generations are more aware and actively involved in sustainable environmental practices.

However, the above interventions must consider resource constraints, including funding limitations, infrastructural deficits, and governance inefficiencies prevalent in semi-urban Nigerian contexts.

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Data availability statement (DAS)

This study used quantitative method, and the primary source of data was used to generate the result. The findings are available within the study.

CRedit authorship contribution statement

Jammy Seigha Guanah: Methodology, Data curation, Conceptualization. **Paul Bebenimibo:** Methodology, Formal analysis, Data curation. **Eric Msughter Aondover:** Supervision.

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