Innovations

Newspaper Framing and Public Perception of Environmental Challenges in Southeast, Nigeria

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Abstract

Extreme weather conditions have been the order of the day for several decades around the world, caused by manmade and natural factors. Mass media, especially newspapers, have been credited as being well placed to tackle societal problems like environmental challenges through the framing of the important issues for the general public. The present study examines newspaper framing and attitude to environmental challenges in Nigeria. The survey part of the study covered the five states in Southeast Nigeria, namely, Abia, Anambra, Ebonyi, Enugu, and Imo. Four national dailies (the Daily Sun, The Guardian, The Nation, *and* Vanguard) *were content analysed for a period of two years (2020 and 2021). Results showed that the environmental challenges most reported by the Nigerian newspapers were climate change, and desertification. The frames used by the newspapers in reporting environmental challenges, in their order of magnitude are mitigation, government efforts, and public reaction. There is a strong relationship between attitude to environmental challenges and the framing used by the newspapers. There is a moderate but significant (p < 0.05) correlation between respondents' knowledge level and newspaper framing of environmental challenges. The implications of the findings have been discussed in the study.*

Introduction

Studies are getting feverishly strident about the looming environmental catastrophes facing the entire human populace, for example, climate change, shortage of clean and accessible freshwater, ecosystem degradation, soil erosion, and biodiversity loss (Nwankwo, 2017; Chen, Ge & Zhang, 2005). Particularly, Nigeria's climate has been changing, evident in increases in temperature, variable rainfall, rise in sea level and flooding, drought and desertification, land degradation, more frequent extreme weather events, affected freshwater resources and loss of biodiversity (Ebele & Emodi, 2016; Enete, 2014; Olapido, 2010; Dioha & Emodi, 2018). The northern part of the country, for example, is harassed by desertification, while the southern part is beleaguered by deforestation, shifting rainfall pattern and erosion (Lyytimaki, 2012; Onobe, 2017; Meidugu, 2014; Babalola, Babalola & Okhale, 2010).

The environmental threat is exacerbated by inadequate awareness about the scale of the threat, which results in more damaging actions by people to the environment as well as poor level of response by society in general (Asthana & Asthana, 2013; Ibimilua & Ibimilua, 2014). One of the institutions that are

responsible for creating awareness about environmental challenges is the mass media, among which the newspaper takes an important place in shaping perceptions and creating awareness (Boyagoda, 2017; Kushwaha, 2015; De Vreese, 2005; Boykoff & Roberts, 2007). Newspapers in Nigeria still reach 22% of Nigeria's 40 million daily mass media audience (Bello, 2015). A growing field of interest has emerged in the way environmental messages are communicated and framed to the public by newspapers (Ford, 2010; Abdullah, 2014; Marks, Kalaitazandonakes, Wilkins & Zakharova, 2007). Studies are in agreement that framing is crucial in helping the public to form opinions about important social issues (Scheufele & Tewksbury, 2007; Tewksbury, Jones, Peske, Raymond, & Vig, 2000).

Studies have however shown great concern that despite the relatively high level of media coverage and public concern, members of the audience still do not understand the relationship between the causes of environmental problems and the possible solutions to them (Onobe, 2017; Lyytimaki, 2012). This has in part affected environmental policy and actions because government's strategy seems not to be working and the public shows little willingness to embark on environmental friendly actions. The present study attempts to show the link between environmental reporting and public attitude to environmental issues as a way to present important guides on information presentation, awareness creation and government policy. The general objective of the study is therefore to examine the newspaper framing and public perception of environmental challenges in Nigeria. The specific objectives of the study were to:

- Examine the priming (importance) of environmental challenges in Nigerian newspapers.
- Identify the environmental challenges reported in Nigeria newspapers.
- Determine the frames used in coverage of environmental challenges in Nigeria newspapers.
- Examine the level of audience exposure to environmental challenges in Nigerian newspapers.
- Ascertain the knowledge level of respondents about environmental challenges in South East Nigeria.
- Examine respondents' attitude to newspaper reportage of environmental challenges in South East Nigeria.

The study was also guided by the following hypotheses.

Hypothesis One: Framing of environmental challenges does not correlate with respondents' attitudes to environmental challenges in South East Nigeria.
Hypothesis Two: Knowledge level in South East Nigeria does not correlate with the framing of environmental challenges
Hypothesis Three: Exposure level in South East Nigeria does not correlate with the volume of coverage
Hypothesis Four: Knowledge level in South East Nigeria does not correlate with the framing of environmental challenges

Media Framing and Public Perception of Environmental Issues

Environmental challenges have been posing a great threat to all aspects of human wellbeing. It is estimated that almost half of the jobs worldwide depend on agriculture, fisheries or forests and the non-sustainable use of these resources portends dire consequences for humanity in general (Parveen, 2016). Studies have underscored the central role of the media in powerfully presenting these realities to the public (Parveen, 2016; Dutt, Garg & Bhatta, 2013, Raj & Sreekumar, 2011; Hasan & Dutta, 2019). In 2008, United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) independently called for improved media coverage of climate change (Onobe, 2017). This call particularly points to framing and interpretations of environmental challenges. As it is, the need for improved media coverage and framing of environmental issues is far greater in non-industrialized countries, which are highly vulnerable to climate change and where adaptation appears more urgent than reducing emissions (Onobe, 2017).

McDonald (2009) states that frames in communication refer to the style used by a presenter, such as a journalist or a political leader, in providing information. Emphasis, word use, schemata and interpretations are major ways the media frame issues (Scheufele, 2000; Druckman, 2001). The words 'global warming' and 'climate change' have presented problems that have needed media framing to clarify and understand (Boykoff, 2007). Thus, a key understanding from the framing literature is to consider individual and group internal schema (sometimes called frames in thought), before constructing external frames in communication (Boykoff & Boykoff, 2002). Effective framing of an issue such as environmental sustainability may increase attention by presenting information in an accessible, relevant way for the audience. For example, climate change, when framed with an emphasis on an "environmental issue," may appear to lack urgency or salience to the audience, as opposed to being framed in terms of economic or human losses from unpredictable weather (Anaeto, Onabajo, & Osifeso, 2008; Antilla, 2005; Boykoff & Mansfield, 2008).

Boykoff (2007) notes that when media framing confuses rather than clarifies scientific understanding of anthropogenic climate change, it can create space for policy actors to defray responsibility and delay action Thus, news media coverage plays a significant role in shaping possibilities for future climate policy implementation as well as on public action towards government policy. According to Onobe (2017), members of the public often depends on media frames to form impressions about social issues. Thus perception involves the examination of people's awareness, emotions and behaviour about their environment or any other perceived object (Gieseking, Mangold, Katz, Low, & Saeger, 2014). Olowoporoku (2019) states that the findings of environmental perception studies could help design education and enlightenment programmes to mitigate environmental hazards and risks in the study area. Perceptions of environmental conditions are key to informing behaviour, including the need to adapt to a changing climate (Nash, Capstick, Whitmarsh, Chaudhary & Manandhar, 2019; Olowoporoku, 2019).

So far, existing studies on media framing of environmental issues in Nigeria have mainly dwelt on general coverage, public perception, climate change, framing and challenges (Fawole, 2009; Ukonu, Apkan & Anorue, 2009; Nwabueze, Nnaemeka, Umeora & Okika, 2015; Batta, Ashong & Bashir, 2013; Obafemi, Eludoyin & Akinbosola, 2012). Some studies have also focused on specifics such as erosion, global warming, pollution, and public awareness levels (Fawole, 2009; Abdullah, 2014).

There have also been a dominant preoccupation with variables such as magnitude, directionality, frequency, genre, and knowledge level (Abbas & Emenyeonu, 2015; Onobe, 2017; Hasan & Dutta, 2019). There have however yet to be a significant number of studies correlating the reportage of environment with public knowledge of the subject matter. Studies which attempted this largely focused on climate change and pollution, and mostly measured momentary, linear impacts based on specific events (Onobe, 2017; Ogunjinmi, Onadeko & Ogunjinmi, 2013; Nnadiukwu & Omeje, 2019). The preset study correlates public attitudes to environmental challenges with newspaper reporting in an attempt to create a wider context to understand public and media attitudes to environmental issues. Such studies in countries such as the United States have helped the media, the public and policy makers to place emphasis where it is needed especially in terms of environmental agenda setting, implementation and public action (Dispensa & Brulle, 2003; Emenyeonu & Mohamad, 2017).

Media Framing Theory

Framing media theory was propounded by Erving Guffman in 1974. He referred to it as framing analysis. However, it was Robert Entman who gave it a media outlook. An important proposition of media framing theory is that communication text in news reports bears semblance with and could share a common wavelength of reasoning between the intention of the sender of the message and the mental disposition of the receiver. In other words, there is never an unframed message if it is a message at all. Thus, in the variables of message intent enunciated by Entman (1993), a message frame always involves ingredients of salience purposively or surreptitiously; meaning, it attracts attention to something by amplifying what it draws attention to.

According to Entman (1993), media framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described. The term salience, according to Entman (1993) means: "making a piece of information more noticeable, meaningful, or memorable to the audience" (p.53). An increase in salience improves the probability that the audience will remember the information. Thus, Freyenberger (2013) notes that information can be added or taken out according to the message that the media want to communicate to the public. The theory projects framing as a perceptual activity endorsed to carry out four functions as Entman (2008) submits, namely: define problems, specify causes, convey moral assessments, and endorse remedies" (p.391)

Framing theory justifies media people's attitude of slanting a report in that the action inadvertently spotlights how the media draws attention to something by giving salience to others. Thus, Nisbet (2009) observes that framing a policy problem or issue endows certain dimensions of the complex issue with greater apparent relevance than they would have under an alternative frame. To make sense of policy debates, audiences use frames provided by the media as interpretive shortcuts but integrate these media presentations with pre-existing interpretations forged through personal experience, partisanship, ideology, social identity, or conversations with others. A-frame links two concepts so that after exposure to this linkage, the intended audience now accepts the concepts' connection. In many cases, a specific frame only is effective if it is relevant or applicable to the audience's pre-existing interpretations. The input of this theory to the present study is that when newspapers frame environmental issues, it increases the chances of the public attaching importance to the challenges so that permanent solutions can be pursued by relevant agencies.

Selective Perception Theory

Selective perception theory argues that previous experiences and current disposition go a long way to determine how readers decode newspaper messages. Thus, our temperament, needs, memories and motives affect our reaction to messages on any issue. For instance, in Nigeria where members of political parties see themselves as members of 'one family', party loyalists may choose to ignore any adverse report on the party or preferred candidate. The tendency is to attribute such adverse report to 'media bias'. Perception based on such disposition may affect the audience interpretation and judgment of electoral events.

The selective perception theory came up when scholars discovered that the audience of mass communication is not passive as the all-powerful media effects theory proposed. The Royal Institute of British Architects (RIBA, 2011) subsequently identified four factors that determine the effects of floods on humans as the level of predictability of floods, the rate of onset of the flood, the speed and depth of the water, and the duration of the flood. In the context of this study, the level of predictability involves the timing, accuracy, and communication of warnings given before a flood. McCarthy and Dolfsma (2014) argued that the media shape our opinion "by choosing what events to report on, how much and how frequent to report on a subject and what language to use when describing an event, thus the media can influence public perception" (p. 48). Although some scholars believe in the persuasive power of the media, others go a step further to look at certain elements that can also shape the perception of an individual (Barone & Swan, 2007; Jones & Rainey, 2006).

Friedman (2015) believes that several factors such as socio-demographic characteristics can influence people's perception as "the mass media are not the only source of environmental information for people" (p. 144). Subsequently, Sampel and Aoyagi-Usui (2009) after their study on media coverage and influence of public opinion on climate change in Japan suggested that "…effective communication of climate change, strategies aimed at maintaining mass-media coverage of global warming are required" (p. 203). Folarin (2002) therefore argues that "each of us tends to perceive and then decode communication messages in the light of our previous experiences and current dispositions-our needs, moods and memories. The language we speak, and the words we use tend to circumscribe our perception" (p. 71).

The theory of selective perception "has been conceptualized as a four-part process consisting of selective exposure, attention, comprehension, and retention" (Taylor, Franke, & Bang, 2006, p. 23). Therefore, People can selectively expose themselves to media messages, they can selectively pay attention to certain elements of a message, they can select how to perceive or interpret a message and they can select what to retain and recall, or learn from the media. (Werder, 2009, p. 633) Perception, therefore, entails the interpretation an individual gives to certain events around them. A study of people's perception of the environmental challenges will go a long way in assessing the influence of newspaper reportage of the event had on the people.

Research Design

A mixed research method of content analysis and survey was used. The population of the content analysis was derived from 1,464 editions of four Nigerian newspapers (from 2020 to 2021), namely, *The Guardian, Vanguard, The Nation* and *Daily Sun*. One week was randomly selected in each month under study: January, March, April, June, July and November (2020 to 2021). This amounted to 60 editions for each of the selected newspapers across two years. A total of 240 editions of the selected newspapers (16%) formed the sample size for content analysis. According to Wimmer and Dominick (2011), when determining sample size in content analysis, a sample size of 10% to 25% is recommended. The Australian Calculator as given by the National Statistics Service (NSS), was employed in computing 385 as the sample size for the survey. To calculate the inter-coder reliability, Holsti's inter-coder reliability formula was used to compute a co-efficiency of 87%. A rule of thumb, according to Pointexter and McCombs (2000), for acceptable reliability is 80 per cent or above

The survey employed adults from 18 years and above who come within areas reached by the selected newspapers in the Southeast geopolitical zone of Nigeria. The region is made up of five states, namely, Abia, Anambra, Ebonyi, Enugu and Imo, whose total population is 16,388,378.

The purposive sampling technique was employed to select a senatorial district from each of the five states (districts within the state capitals). Using a simple random sampling method, a local government area was selected from each senatorial district (Table 3).

Table 3: Analysis of Selected Senatorial Districts, LGA and Towns

State	Proportional Sample Size	Senatorial District	L.G. A.	Towns
Abia	66	Abia Central	Umuahia North	Umuahia Urban I
Anambra	97	Anambra North	Anambra East	Igbariam
Ebonyi	52	Ebonyi North	Abakaliki	Ntezi Aba
Enugu	79	Enugu East	Enugu East	Abakpa
Imo	91	Imo East	Owerri Municipal	Umuodu

A reliability co-efficiency of .79 was computed for the questionnaire, using the test-retest methods measured with the Cronbach alpha.

Results

Table 4: Respondents' Demographic Characteristics

Demographic Characteristics		Frequency	Percent	Cumulative Percent
Sex	Male	135	46.7	46.7
	Female	154	53.3	100.0
Age	18-25years	92	31.8	31.8
	26-33years	59	20.4	52.2
	34-40years	39	13.5	65.7
	Above 40years	99	34.3	100.0
Marital Status	Single	152	52.6	52.6
	Married	118	40.8	93.4
	Never married	19	6.6	100.0
Level of Education	Primary	17	5.9	5.9
	Secondary	29	10.0	15.9
	Tertiary	243	84.1	100.0
Occupation	Public servant	141	48.8	48.8
	Business	17	5.9	54.7
	Student	117	40.5	95.2
	Unemployed	14	4.8	100.0
Religious Affiliation	Christianity	287	99.3	99.3
	African Traditional Religion	1	0.35	99.65
	No religious affiliation	1	0.35	100.0

The results in the table revealed that there are slightly more female respondents (53.3%) than male respondents (46.7%). Majority (65.7%) of the respondents are at most 40 years of age while only 34.3 % are above the age of 40 years which shows a good distribution of respondents with more of the youthful population. Also, 52.6% of the respondents are single, giving credence to the youthful inclination of the respondents while the remaining 47.4% are married (40.8%) or never married (6.6%). The analysis of the educational level of the respondents show that as much as 84.1% have tertiary education, indicating that the study population is well-educated, which is very vital for the study for accurate data collection. The remaining 15.9% have either primary education (5.9%) or secondary education (10.0%). The occupational distribution of the respondents shows that 48.8% of the respondents are public servants while 40.5% are students. The remaining 18.7% are either business people (5.9%) or unemployed (4.8%). This shows a mixed distribution of the respondents which is good for the study as it offers wider opinion scope of the subject matter on environmental challenges in Southeast Nigeria. The analysis of the religious affiliation of the respondents revealed that 99.3% indicated that they belong to Christianity while the other 0.7% are either traditionalist (0.35%) or have no religious affiliation (0.35%). The results of the religious affiliation is obvious due to the Southeast being a predominantly Christian region.

Data Presentations and Analysis of Research Questions

Objective One

To Examine the priming (importance) of environmental challenges in Nigerian newspapers

Tables 5 (volume of coverage) and 6 (genre) contain the analyses used to address objective one.

Table 5: Volume of Coverage of Environmental Challenges from 2020 to 2021

Newspaper		Year		Total
		2020	2021	
Daily Sun		28(9.7%)	37(12.8%)	65(22.5%)
The Guardian		41(14.2%)	30(10.4%)	71(24.6%)
The Nation		23(8.0%)	45(15.6%)	68(23.5%)
Vanguard		33(11.4%)	52(18.0%)	85(29.4%)
Total		125(43.3%)	164(56.7%)	289(100.0%)

The results in Table 5 show that 22.5 % of reports on environmental challenges in 2020 (9.7%) and 2021 (12.8%) were covered by Daily Sun newspaper. The Guardian covered 24.6% of the environmental challenges in 2020 (14.2%) and 2021 (10.4%). The Nation newspaper covered 23.5% of the reports on environmental challenges from 2020 (8.0%) to 2021 (15.6%) while Vanguard covered 29.4% from 2020 (11.4%) to 2021 (18.0%). These results show that Vanguard newspaper has the highest volume of coverage of environmental challenges. This is followed by The Guardian, and then The Nation newspapers. Daily Sun has the lowest volume of coverage of environmental challenges in the Southeast. Moreover, the higher volume of coverage (56.7%) of the environmental challenges was in 2021 while (43.3%) was in 2020. This also shows increase in volume of coverage of environmental challenges from 2020 to 2021.

Table 6: Genres Used in the Coverage of Environmental Challenges

Story genre		Newspaper				Total
		Daily Sun	The Guardian	The Nation	Vanguard	
News		39(13.5%)	38(13.1%)	41(14.2%)	51(17.6%)	169(58.5%)
Features		2(0.7%)	5(1.7%)	7(2.4%)	4(1.4%)	18(6.2%)
Editorials		5(1.7%)	7(2.4%)	4(1.4%)	5(1.7%)	21(7.3%)
Letters to Editor		7(2.4%)	13(4.5%)	9(3.1%)	15(5.2%)	44(15.2%)
Opinion articles		12(4.2%)	8(2.8%)	7(2.4%)	10(3.5%)	37(12.8%)
Total		65(22.5%)	71(24.6%)	68(23.5%)	85(29.4%)	289(100.0%)

Table 6 shows that news is the story genre used 58.5% of the study period in the coverage of environmental challenges by Daily Sun (13.5%), The Guardian (13.1%), The Nation (14.2%) and Vanguard (17.6%). Features was used 6.2% of the study period in the Daily Sun (0.7%), The Guardian (1.7%), The Nation (2.4%) and Vanguard (1.4%) newspapers for the coverage of environmental challenges in the region. Editorials appeared a total of 21 (7.3%) times in the study period in Daily Sun (1.7%), The Guardian (2.4%), The Nation (1.4%) and Vanguard (1.7%) in the coverage of environmental challenges. Letters to the Editor appeared 44 (15.2%) times in Daily Sun (2.4%), The Guardian (4.5%), The Nation (3.1%) and Vanguard (5.2%) during the study period. Similarly, opinion articles appeared a total of 37(12.8%) in Daily Sun (4.2%), The Guardian (2.8%), The Nation (2.4%) and Vanguard (3.5%) from 2020 to 2021. These results show that news was the most used genre in the coverage of environmental challenges among Nigerian newspapers, followed by Letters to the Editor. The least used genres in the coverage of environmental challenges are Features and Editorials. Vanguard newspaper has the highest (29.4%) used of the genres in their coverage of the environmental challenges; this was followed by The Guardian (24.6%). The newspaper with the least use of the genres in their coverage of the environmental challenges is Daily Sun (22.5%) and news was the most used genre by each of the newspapers.

Objective Two

To identify the environmental challenges reported in Nigeria newspapers.
The results showing the environmental challenges reported by the Nigerian newspapers are summarized in Table 7.

Table 7: Environmental Challenges Reported by Nigerian Newspapers

Kinds of environmental challenges	Newspaper				Total
	Daily Sun	**The Guardian**	**The Nation**	**Vanguard**	**Total**
Loss of Biodiversity	4(1.4%)	8(2.8%)	7(2.4%)	3(1.0%)	22(7.6%)
Flooding	10(3.5%)	15(5.2%)	2(0.7%)	8(2.8%)	35(12.1%)
Pollution	5(1.7%)	1(0.3%)	10(3.5%)	7(2.4%)	23(8.0%)
Climate Change	14(4.8%)	12(4.2%)	16(5.5%)	31(10.7%)	73(25.3%)
Global Warming	8(2.8%)	10(3.5%)	5(1.7%)	12(4.2%)	35(12.1%)
Desertification	10(3.5%)	7(2.4%)	14(4.8%)	9(3.1%)	40(13.8%)
Deforestation	7(2.4%)	10(3.5%)	12(4.2%)	3(1.0%)	32(11.1%)
Erosions	7(2.4%)	3(1.0%)	0(0.0%)	4(1.4%)	14(4.8%)
Landslides	0(0.0%)	5(1.7%)	2(0.7%)	8(2.8%)	15(5.2%)
Total	65(22.5%)	71(24.6%)	68(23.5%)	85(29.4%)	289(100.0%)

The environmental challenges identified by the newspapers in descending order are climate change (25.3%), desertification (13.8%), flooding (12.1%), global warming (12.1%), deforestation (11.1%), pollution (8.10%), loss of biodiversity (7.6%), landslide (5.2%) and erosion (4.8%). Daily Sun did not report landslide as environmental challenge while erosion was not reported by The Nation during the period under study. The most reported environmental challenge by any single newspaper during the period is climate change by Vanguard (10.7%), climate change by The Nation (5.5%), flooding by The Guardian (5.2%) and climate change by Daily Sun (4.8%).

Objective Three

To determine the frames used in coverage of environmental challenges in Nigerian newspapers

The results of the media frames used by the Nigerian newspapers in the coverage of environmental challenges are presented in Table 8.

Table 8: Frames used in the Coverage of Environmental Challenges

Frames of newspaper	Newspaper				Total
	Daily Sun	**The Guardian**	**The Nation**	**Vanguard**	
Political Agenda		10(3.5%)	6(2.1%)	9(3.1%)	13(4.5%)	38(13.1%)
Government Efforts		13(4.5%)	8(2.8%)	12(4.2%)	17(5.9%)	50(17.3%)
Economic Agenda		4(1.4%)	8(2.8%)	7(2.4%)	0(0.0%)	19(6.6%)
Mitigation		19(6.6%)	23(8.0%)	17(5.9%)	32(11.1%)	91(31.5%)
Social Agenda		0(0.0%)	3(1.0%)	5(1.7%)	1(0.3%)	9(3.1%)
Public Reaction		5(1.7%)	9(3.1%)	11(3.8%)	16(5.5%)	41(14.2%)
Environmental Legislation		7(2.4%)	5(1.7%)	2(0.7%)	2(0.7%)	16(5.5%)
Global Concern		7(2.4%)	9(3.1%)	5(1.7%)	4(1.4%)	25(8.7%)
Total		65(22.5%)	71(24.6%)	68(23.5%)	85(29.4%)	289(100.0%)

The frames used by the newspapers in reporting environmental challenges, in their order of importance, are: mitigation (31.5%), government efforts (17.3%), public reaction (14.2%), political agenda (13.1%), global concern (8.7%), economic agenda (6.6%), environmental legislation (5.5%) and social agenda (3.1%). Mitigation is the frame identified the most by each of the newspapers, Daily Sun (6.6%), The Guardian (8.0%), The nation (5.9%) and Vanguard (11.1%). Economic agenda was not a frame used by Vanguard while Daily Sun did not use social agenda as a frame in the coverage of environmental challenges within the period of study.

Objective Four

To examine the level of audience exposure in South East to environmental challenges in Nigerian newspapers

The level of exposure of respondents to environmental challenges in the Nigerian newspapers are analyzed with frequencies and percentages and the results presented in Table 9.

Table 9: Level of Exposure to Newspaper Reports on Environmental Challenges

Exposure	Very often	often	Rarely	Very rarely	Never
How often do you read newspaper	38(14.1%)	83(30.9%)	81(30.1%)	39(14.5%)	28(10.4%)
How often do I read reports on environmental in the newspaper	23(8.6%)	61(22.7%)	97(36.1%)	54(20.1%)	34(12.6%)
Frequency at which you have read reports on environmental pollution	39(14.6%)	80(29.9%)	92(34.3%)	34(12.7%)	23(8.6%)
Frequency at which you have read reports on desertification	29(10.8%)	59(22.0%)	106(39.6%)	36(13.4%)	38(14.2%)
Frequency at which you have read reports on deforestation	29(10.8%)	69(25.7%)	101(37.5%)	38(14.1%)	32(11.9%)
Frequency at which you have read reports on Waste disposal	48(17.8%)	78(29.0%)	84(31.2%)	35(13.0%)	24(8.9%)
Frequency at which you have read reports on flooding	49(18.3%)	87(32.5%)	73(27.2%)	32(11.9%)	27(10.1%)
Extent to which television is a source of information on environmental challenges	90(33.6%)	106(39.6%)	45(16.8%)	14(5.2%)	13(4.9%)
Extent to which radio is a source of information on environmental challenges	58(21.6%)	112(41.6%)	59(21.9%)	29(10.8%)	11(4.1%)
Extent to which magazines are sources of information on environmental challenges	50(18.7%)	78(29.1%)	80(29.9%)	40(14.9%)	20(7.5%)
Extent to which social media is a source of information on environmental	144(53.5%)	64(23.8%)	39(14.5%)	13(4.8%)	9(3.3%)

The results in the table revealed that more than half (55.0%) of the respondents rarely or never read newspapers. Only 45.9% of the respondents read newspaper often or very often. About 68.0% of the respondents rarely or never read about environmental challenges in the newspapers. This should be expected since a good number of the respondents do not read newspapers. More than half of the respondents have rarely or never read reports on environmental pollution (55.6%), desertification (67.2), deforestation

(63.5%), waste disposal (53.1%), and flooding (49.2%). The table further revealed that majority of the respondents use often or very often television (73.2%), radio (63.2%) and social media (77.3%) as alternative sources of information on environmental challenges. Magazine, which is in the same category with newspaper as print media was rarely or never used by 52.3% of the respondents as alternative source of information on environmental challenges These results clearly show that the respondents are rarely or never exposed to newspapers and magazines as the sources of information on environmental challenges but are exposed to the use television, radio and social media often as sources of information on environmental challenges.

Objective Five

To appraise respondents' level of knowledge environmental challenges in Nigeria?

The results of the analysis are presented in Table 10 on the knowledge level of the respondents about environmental challenges in the study area. The results in the table revealed that large percentage of the respondents agree or strongly agree that changes in atmospheric conditions are danger to food production (86.6%), environmental challenges are caused by man's artificial activities (86.2%), changes in the environment affect the inhabitants negatively (86.6%), inconsistent change in weather conditions results to struggle for environmental resources (75.8%), gradual worsening of the weather conditions is caused by the emission of carbon into the atmosphere (81.4%), excessive rainfall causes flooding Environmental challenges lead to low crop yield (86.2%), the spread of climatic sensitive diseases like malaria is a result of changes in weather conditions (56.6%), increase in desert encroachment and deforestation exacerbate environmental challenges (75.4%) and environmental challenges increase sunshine intensity and heat conditions (69.5%). Very few of the respondents are undecided, disagree of strongly disagree. These results strongly indicate that the respondents have high knowledge level of the environmental challenges in the study area.

Table 10: Respondents' Level of Knowledge of Environmental Challenges

Knowledge	Strongly agree	agree	Undecided	Disagree	Strongly disagree
Changes in atmospheric conditions are danger to food productions	131(48.7%)	102(37.9%)	16(5.9%)	16(5.9%)	4(1.5%)
Environmental challenges are caused by man's artificial activities	116(43.1%)	116(43.1%)	23(8.6%)	12(4.5%)	2(0.7%)
Changes in the environment affect the inhabitants negatively	113(42.0%)	120(44.6%)	23(8.6%)	9(3.3%)	4(1.5%)
Inconsistent change in weather conditions results to struggle for environmental resources	81(30.1%)	123(45.7%)	44(16.4%)	15(5.6%)	6(2.2%)
Gradual worsening of the weather conditions is caused by the emission of carbon into the atmosphere	98(36.6%)	120(44.8%)	32(11.9%)	14(5.2%)	4(1.5%)
Excessive rainfall causes flooding	148(55.2%)	83(31.0%)	18(6.7%)	17(6.3%)	2(0.7%)
Environmental challenges lead to low crop yield	129(48.0%)	104(38.7%)	16(5.9%)	12(4.5%)	8(3.0%)
The spread of climatic sensitive diseases like malaria is a result of changes in weather conditions	63(23.6%)	88(33.0%)	47(17.6%)	47(17.6%)	22(8.2%)

Increase in desert encroachment and deforestation exacerbate environmental challenges	85(31.7%)	117(43.7%)	44(16.4%)	18(6.7%)	4(1.5%)
Environmental challenges increase sunshine intensity and heat conditions	79(29.4%)	108(40.1%)	44(16.4%)	32(11.9%)	6(2.2%)

Objective Six: To ascertain respondents' attitudes to newspapers reportage of environmental issues

Most of the respondents agreed or strongly agreed that newspaper coverage of environmental issues exposed them to problems of the environment (77.4%), exposed them to possible solutions to the problems (76.2%), influences the knowledge of public members (76.9%), draws public attention to the environmental problems (82.6%), sensitizes Nigerians on the need to be conscious of their actions (75.4%), educate Nigerians on the need to be involved actively in mitigation projects (72.4%), reveal human activities that portend danger (73.6%), lead to positive involvement in handling environmental challenges (71.6%), make the respondents care more about their daily activities (72.4%) and environmental challenges being threat to humans (76.6%). These results clearly show that there is strongly relationship between public perception of the environmental challenges and the framing used by the newspapers.

Table 11: Respondents' Attitudes to Newspaper Reportage of Environmental Challenges

Relationship	Strongly agree	agree	Undecided	Disagree	Strongly disagree
Newspaper coverage of environmental issues exposes me to problems of the environment	79(29.4%)	129(48.0)	33(12.3%)	17(6.3%)	11(4.1%)
Newspaper coverage of environmental issues exposes me to the possible solutions to the problems	60(22.3%)	145(53.9%)	31(11.5%)	24(8.9%)	9(3.3%)
Newspaper coverage of the environmental issues influences the knowledge of public members	74(27.6%)	132(49.3%)	30(11.2%)	21(7.8%)	11(4.1%)
Newspaper coverage of environmental issues draws public attention to the environmental problems	76(28.3%)	146(54.3%)	25(9.3%)	13(4.8%)	9(3.3%)
Newspaper coverage of environmental issues sensitizes Nigerians on the need to be conscious of their actions	71(26.5%)	131(48.9%)	37(13.8%)	21(7.8%)	8(3.0%)
Newspaper coverage of environmental issues educates Nigerians on the need to be actively involved in mitigation project	67(25.0%)	127(47.4%)	49(18.3%)	15(5.6%)	10(3.7%)
The reports showcase human activities that constitute danger to environmental sustainability	71(26.4%)	127(47.2%)	51(19.0%)	10(3.7%)	10(3.7%)

Newspaper coverage of environmental issues are leading towards positive involvement in handling environmental challenges	62(23.1%)	130(48.5%)	47(17.5%)	18(6.7%)	11(4.1%)
My understanding of environmental issues as reported in newspapers makes me care more about what I do everyday	87(32.3%)	108(40.1%)	42(15.6%)	21(7.8%)	11(4.1%)
I do not think newspapers possess the necessary skills and personnel to handle environmental issues reporting	67(24.9%)	90(33.5%)	53(19.7%)	36(13.4%)	23(8.6%)
Environmental challenges are threat to humans	118(43.9%)	88(32.7%)	37(13.8%)	14(5.2%)	12(4.5%)

Test of Hypothesis and Results

Hypothesis One

Framing of environmental challenges does not correlate with respondents' attitude to environmental challenges in Nigeria.

The results are presented in Table 12. The correlation value is 0.590 with p-value of 0.00 which is less than the 0.05 level of significance ($p < 0.05$) at which the hypothesis was tested. Therefore, there is moderate but significant correlation between newspaper coverage of environmental challenges and respondents' attitudes to the coverage.

Table 12: Results of Correlation between Framing and Respondents' Attitude

		Attitude	Frames of newspaper
Attitude	Pearson Correlation	1	0.590
	Sig. (2-tailed)		0.000
	N	11	11
Frames of newspaper	Pearson Correlation	0.590	1
	Sig. (2-tailed)	0.000	
	N	11	289

Hypothesis Two

Knowledge level does not correlate with volume of coverage of environmental challenges

The results of the correlation analysis of volume of coverage of environmental challenges and the knowledge level of respondents are presented in Table 13. The correlation coefficient is 0.514 with p-value of 0.00, which is less than the 0.05 level of significance ($p < 0.05$) at which the hypothesis was tested. This implies that there is moderate but significant correlation between the respondents' level of knowledge of the environmental challenges and the volume of coverage of the environmental challenges by the newspapers.

Table 13: Results of Correlation between Knowledge Level and Volume of Coverage

		Knowledge level	Volume of coverage
Knowledge level	Pearson Correlation	1	0.514
	Sig. (2-tailed)		0.000
	N	10	10
Volume of coverage	Pearson Correlation	0.514	1
	Sig. (2-tailed)	0.000	
	N	10	263

Hypothesis Three
Exposure level does not correlate with the volume of coverage

The results of the analysis of the correlation between the respondents' level of exposure to environmental challenges and the volume of coverage by the newspapers are presented in Table 14. From the results, the correlation coefficient is 0.552 with p-value of 0.001, which is less than the 0.05 level of significance ($p < 0.05$) at which the hypothesis was tested. Therefore, there is moderate but significant correlation between the respondents' level of exposure to environmental challenges and the volume of coverage of the environmental challenges by the Nigerian newspapers.

Table 14: Results of Correlation between Level of Exposure and Volume of Coverage

		Level of Exposure	Volume of coverage
Level of Exposure	Pearson Correlation	1	0.552
	Sig. (2-tailed)		0.001
	N	11	11
Volume of coverage	Pearson Correlation	0.552	1
	Sig. (2-tailed)	0.001	
	N	11	263

Hypothesis Four
Knowledge level does not correlate with the framing of environmental challenges

The results of the correlational analysis for the respondents' knowledge of environmental challenges and the framing of the environmental challenges by the newspapers are presented in Table 15. The results have shown that there is a correlation coefficient of 0.633 with p-value 0.00. Since the p-value is less than 0.05 ($p < 0.05$) level of significance, then there is strong and significant correlation between knowledge of environmental challenges and the frame used by the newspapers in the coverage of the environmental challenges.

Table 15: Results of Correlation between Knowledge and Frames of Newspaper

		Knowledge	Frames of newspaper
Knowledge	Pearson Correlation	1	0.633
	Sig. (2-tailed)		0.000
	N	10	10
Frames of newspaper	Pearson Correlation	0.633	1
	Sig. (2-tailed)	0.000	
	N	10	263

Discussion of Findings

The study was conducted to examine the relationship between newspaper reportage and audience knowledge and attitudes to environmental challenges in Nigeria. The study attempts to appraise newspapers' scale of preference in the scheme of environmental challenges in Nigeria. This is with a view to making necessary suggestions amidst global environmental concerns. Four Nigerian newspapers were content analyzed, while respondents were statistically selected from the residents of southeast Nigeria.

Findings show that there is low to moderate volume of coverage of environmental challenges in the Nigerian newspapers and the overall volume of coverage increased from 2020 to 2021. Among the four national newspapers. Vanguard gave the highest volume of coverage within the specified period of study while Daily Sun gave the lowest volume of coverage of environmental challenges. This shows that the newspapers do not give equal coverage to the environmental challenges. In addition, environmental challenges constituted less than 0.5% of total coverage in the newspapers, and this was linked to the absence of major environmental challenges around certain times within the period of study. Priority was rather given to other matters that do not pertain to creating awareness on environmental challenges. This reflects the assertion by Guanah (2018) that the media give priority and high volume of coverage to trending issues more than any other issue no matter how important the issue might be. Ngoa (2012) opined that the media focus is a reflection of already existing issues of public concerns. Abbas and Emenyonu (2015) obtained similar results in a study on environmental journalism in Oman where the findings show that issues on environmental challenges are highly under-reported in their local newspaper. That the volume of coverage increased from 2020 to 2021 is an indication that volume of coverage of the environmental challenges can get better with time if the appropriate attention is given to the subject matter by the newspapers.

The story genres identified by the respondents used in coverage of environmental challenges are news, features, editorials, letter to the editor and opinion article. News has been revealed in the study as the story genre most frequently used by the Nigerian newspapers in the coverage of environmental challenges while features is the least used story genres for coverage of the environmental challenges. Studies have shown that the preponderance of news as a source of reporting climate change sacrifices the opportunity for interpretative reporting (Boykoff & Boykoff, 2002). The rarity of use of editorials in the coverage of environmental challenges by the Nigerian newspapers shows that little or no priority is given to the burning issue of environmental challenges. Editorials have very important and powerful role to play in projecting any burning issue to matter of public discuss. Firmstone (2019) succinctly stated that editorial is the only place in the newspaper where the opinions of the newspaper organization are unequivocally stated; that "editorials play a powerful role in constructing political debate in the public sphere". Since the editorials are not used by the newspapers to regularly project the concept of environmental challenges, it then implies that the issue of environmental challenges is not considered important by the newspapers.

Climate change, desertification, flooding, global warming, deforestation, pollution, loss of biodiversity, landslide and erosion were the environmental challenges in the Nigerian newspapers. The most reported environmental challenge is climate change which was about twice more reported than the second most reported environmental challenge (desertification). These challenges were mostly reported by the Vanguard newspaper while the least report on the environmental challenges is associated with Daily Sun. The environmental challenges identified in this study are similar to the ones identified by Emenyeonu (2018) such as pollution, biodiversity, climate change, deforestation, desertification, waste disposal, among others. These were identified in four different national daily newspapers in Nigeria from 2015 to 2016. In the same way, Batta, Ashong and Bashir (2013) identified gas flaring, climate change, desertification and deforestation as the environmental problems in Nigeria. Onobe (2017) also identified flooding, waste, pollution, climate change, deforestation, desertification and erosion as the environmental challenges covered by Nigerian

newspapers. That these same environmental challenges were identified again in the present study may be a clear indication that they are serious are still plaguing the country.

In their order of importance (frequency of use), the frames used by the Nigerian newspapers in the coverage of environmental challenges include: mitigation, government efforts, public reaction, political agenda, global concern, economic agenda, environmental legislation and social agenda. Batta, Ashong and Bashir (2013) identified mitigation as the most used frame in the coverage of environmental challenges by some Nigerian newspapers from 2007 to 2009 among other frames, adaptation and neutral. Mbamalu (2020) listed other frames used by the Nigerian newspapers but for the coverage of renewable energy, which is related to environmental challenges as one of the solutions. Such frames mentioned by Mbamalu include controversy, corruption, politics, efficiency, technology, apathy, domination, etc. However, none of these frames was employed in the coverage of environmental problems. Also, the frames identified by Nwabueze and Egbra (2008) in the coverage of climate change by newspapers in Nigeria and Ghana were not used in the coverage of environmental challenges. It could be observed that fewer frames were used in the coverage of environmental challenges compared to other burning issues such as climate change (identified as a challenge) and renewable energy which is also related to environmental challenge. These still point to the lack of priority given to the issues of environmental challenges in the coverage by the Nigerian newspapers compared to the issue of renewable energy which has gained serious public interest (Mbamalu, 2020).

Due to the problem of low priority in the coverage of environmental challenges by the Nigerian newspapers, the public may have turned to other sources such as the social media, radio and television. Note that there was low exposure to Nigerian newspaper stories on environmental challenges among the participants. The participants were however highly knowledgeable about environmental challenges and the specific causes and consequences such as the artificial activities of man, low crop yield, the spread of climatic sensitive diseases like malaria. This corroborates the belief that the participants are more exposed to other media outlets such as social media, radio and television Onobe (2017) found that the public do not see as serious issue environmental challenges the way they are being reported by the Nigerian newspapers compared to other media.

The hypothesis revealed that there exists moderate but significant positive correlation (p < 0.05) between the South East respondents' level of knowledge of the environmental challenges and the volume of coverage of the environmental challenges by the newspapers. This simply implies that increase in the volume of coverage will lead to increase in the knowledge level of the participants on environmental challenges. Similarly, there is moderate but significant correlation (p < 0.05) between the respondents' level of exposure to environmental challenges and the volume of coverage of the environmental challenges by the Nigerian newspapers. The level of exposure and knowledge level of the participants from the newspaper coverage is low due to moderate volume of coverage by the Nigerian newspapers. Therefore, increasing the volume of coverage in the Nigerian newspapers may increase the level of exposure and the knowledge level of the South East participants on environmental challenges.

Conclusion

Following the findings of the project, there appears to a correlation between the newspaper coverage and public perception of environmental challenges. News is the most frequently used story genres by the Nigerian newspapers in the coverage of environmental challenges and the Vanguard is the newspaper with the highest volume of news coverage of the environmental challenges. The frames used by the newspapers in reporting environmental challenges, in their order of importance, are: mitigation, government efforts, public reaction, political agenda, global concern, economic agenda, environmental legislation and social agenda. Environmental messages should be made to compete for visibility and attention with other kinds of messages. The secret may be to explore both informative and entertaining angles of environmental messages.

Environmental issues reporting will be better with investigative reporting that will encourage debate, purposed on relating problem to solution. This approach will revive a favorable public perception for newspapers' coverage of environmental issues in the South East Nigeria.

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