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CLIMATE CHANGE COMMUNICATION IN NIGERIA: TOWARDS PROFFERING SUSTAINABLE ALTERNATIVES

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Abstract

Community and global efforts at mitigating climate change have been greatly influenced by the media's portrayal of climate change inNigeria and sub-Saharan Africa. Mitigation and adaptation measures have also been closely linked to people's perceptions and understanding gained through daily exposure to media content, individual media consumption and news production by mainstream media. Despite this dependence on media consumption by the people, it has been generally acknowledged that "journalists, especially in the developing world, are not sufficiently equipped to process and effectively communicate climate change information' in a manner that would galvanise popular participation in climate change mitigation efforts. Even though environmental reporting is fast becoming an important genre of journalism, and environmental consciousness within newsrooms continue to rise, environmental issues associated with climate change have not received the needed attention. With little or no specialisation in many newsrooms across Nigeria, it has become increasingly difficult for journalists to understand the phenomenon, process technical information, as well as sustain narratives on climate change adaptation issues and prospects for integrating them into decision-making. Yet this ability of the media to set the agenda by creating awareness and mobilising media consumers to collective action is right at the centre of all mitigation initiatives. Therefore, these challenges gave rise to this paper which examines: ***Climate Change Communication in Nigeria: Towards Proffering Sustainable Alternatives.****Adopting Agenda setting as a theoretical framework and qualitative research method, the paper gave a detailed evaluation of the concepts of climate change and climate change communication. Also, the principles of climate change communication were exhaustively examined. The paper concluded by recommending an effective approach to climate change communication in Nigeria.*

KEYWORDS*: Climate Change, Climate Change Communication; Effective Climate Change Communication; Principles of Climate Change Communication; Theories of Climate Change Communication*

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I. Introduction

Climate Change made the news for the first time in human history about three decades ago (Revkin, 2007). Since then, it has continued to dominate global discourses, with scholars and researchers devoting a significant portion of their work to addressing its challenges. Unfortunately,as some argue, this age-long problem has remained unfixed and in some quarters of the world, unattended to or simply ignored.Despite the increasing proliferation in communication and related discipline journals since the late 1990s, carbon emissions have continued to increase both globally and domestically, even as societies have continued to be vulnerable to climate variability (Nerlich, Koteyko and Brown, 2010). Even the numerous talks, conferences and negotiations by scientists, climate activists and politicians that have been ongoing for decades, have done very little in progressing ourintentionally determined actions.Atcheson (2012)argues that as our planet undergoes radical change as a result of the build-up of greenhouse gases in the atmosphere, it is clear that actions to mitigate the effects of climate change and adapt to its impacts are critical.One major reason advanced for the slow progress is the non-mobilisation and non-participation of the public around this challenging global phenomenon. This is further exacerbated by the challenge of effectively communicating the science of climate change to policymakers in a manner that it would be understood to give it the action it deserves in parliaments. It has been generally recognised that the media and journalists have critical roles to play in influencing policymakers to take action on adaptation to climate change. In other words, they do have significant roles to play in reinforcing efforts at mainstreaming climate change adaptation into development planning and policy. They also have a major role to play in shaping public debate and informing decision-makers through print and electronic media.

Unfortunately, as African participants at the CCAA/3rd EAHSC Symposium in Kenya (2009) noted, journalists, especially in the developing world, are not sufficiently equipped to process and effectively communicate climate change information'. Even though environmental reporting is fast becoming an important genre of journalism, and environmental consciousness within newsrooms continue to rise, environmental issues associated with climate change have not received the same attention. With little or no specialisation in many newsrooms across the continent, it has become increasingly difficult for journalists to understand the phenomenon, process technical information, as well as sustain narratives on climate change adaptation issues and prospects for integrating them into decision-making. It is against this background that this paper seeks to critically examine the issues and prospects in climate change reporting and communication in Africa, particularly Nigeria to proffer sustainable paradigm/alternatives to climate change mitigation.

Climate Change: A Brief Overview

The potentially disruptive impact of heat-trapping emissions from burning fossil fuels and rain forests have contributed largelyto climate change and environmental pollution, which we are currently grappling with (Revkin, 2007). Citing the pioneering work of a Swedish Scientist, Svante Arrhenius (1896), Revkin (2007) notes that the concerns about the rise in temperature and carbon dioxide levels, which Peters (1870) attributed to human emissions emanating from extensive coal burning and fossil fuels were left unaddressed for over three decades. The 1956 story published in the National Geographic magazine highlights how accumulating greenhouse gas emissions from energy

production, which includes continual burning of fossil fuels, coal and oil, could lead to long-lasting environmental problems. This warning probably sounds familiar but has continued to generate a lot of debates and controversies.Pandya (2019) explains that the climate is undoubtedly changing from what it used to be and we need to be rightly informed about the causes of this change and how the rising temperature affects the environment and human lives.Many scholars haveextensively noted the impacts of climate change such as flooding, falling crop yields, heat exhaustion and stroke, urban heat island, pest infestation of farmlands, high variability and uncertainty in rainfall and spikes in temperatures, windstorms etc.(Basara,Basara, Illston and Crawford, 2009; Adhikari, Nejadhashemi and Woznicki, 2015; Ojeh, Balogun and Okhimamhe, 2016; Chepkoech, Mungai, Stober, Hett and Campen, 2018; Leeper, Kochendorfer, Henderson and Palecki, 2019). These are already being experienced both in urban and rural areas of many nations of the world. The current challenge of Coronavirus Disease (COVID-19), as well as Ebola, have been linked to the loss of our bio-diversities such that humans are now having frequent contact with wild animals with dire consequences to our health. This view is consistent with the earlier submission ofAtcheson (2012) who argued that 'the magnitude of the changes we can expect to see and will be required to adapt to is largely in our hand … and that by engaging in strong mitigation efforts now, we can make the difference between three degrees and eight degrees Celsius of warming'. Henson(2011) agrees with Atcheson's (2012) view when he opines that 'given the magnitude of the issue, and the urgency with which it must be addressed, we need to respond rapidly and thoughtfully.' The implication of all these is that it is largely up to us, as individuals, communities, institutions and the general public immersed within a fossil-fuel based economy, to react accordingly (Henson, 2011),

The urgency to act right and act now is further emphasised by Pandya's (2019) reference to the harmful effects of climate change on humans such as ingestion of the Earth's toxins, greenhouse gases, and production of vast amounts of wastes, as well as on plants and animals. Scientific evidence about global warming and the adverse effect of human activities on the climate are obvious to us, yet the present-day earth climate is still aflame with heatwaves, wildfires, floods and frequent hurricanes (Pandya, 2019). While some politicians have continued to query the actual direct impact of global warming on health and environment of all species, it is becoming increasingly obvious to a significant proportion of the world's population, which has continued to suffer from the adverse impact of climate change.Environmental activists lament the tendency by the modern world to live in a constant state of denial and weird positivism, simply waiting for someone else to take action. This is despite the strong correlation that has been established between human activities and climate change by the Intergovernmental Panel on Climate Change (IPCC). As noted in the series of assessment reports on the causes, impacts, and potential response strategies for the public, the IPCC projected models themselves are complex and ridden with uncertainties (such as population growth and socio-economic development), the message they convey is clear: the number of fossil fuels we burn today will have profound impacts on the future' (IPCC, 2007). Scientists and experts express grave concern about what they term the 'frightening effect' of greenhouse gas emissions on planetary degrees of warming, which we have already witnessed, and may continue to experience 'even if we were to stabilise emissions today' (Solomon, et al 2009). It has been suggested that the solution lies in the Montreal Protocol endorsed by the world's nations as they commit to taking concrete steps to 'eliminate certainsynthetic compounds imperilling the atmosphere's protective ozone layer' (IPCC, 2007; Solomon, Plattner; Knutti&Friendlingstein, 2008). Other scholars

like Revkin (2018) support this position but wonder if the main causes of climate change can be limited to human activities since other basic vulnerabilities to curbing climate hazards have been implicated. These include lack of basic research funding, industry influence on politics, doubt-sowing by non-state fossil fuels investors, poor media coverage as well as 'inconvenient mind' – a description for a host of human behavioural traits and social norms that compete against climate change rights (Revkin, 2018). Harvard University Professor, McElroy (1998) notes that 'if we choose to take on this challenge, it appears that we can slow the rate of change substantially, giving us time to develop mechanisms so that the cost to society and the damage to ecosystems can be minimised. We could alternatively close our eyes, hope for the best, and pay the cost when the bill comes due." The implication of the above two scenarios, according to Revkin (2018), while citing the work of an Astrophysicist, Adam Frank (2018) is that 'the first scenario, the 'soft landing' is one in which a civilisation and its planet come smoothly to a new, steady-state'; while the second is 'die-off' in which a planet's environmental conditions degrade and populations drop precipitously, but seem to survive' He doubts 'if a technological civilisation could survive losing something like 70 per cent of its population'. Frank (2018) presents a third scenario where 'the population rises, the planetary state 'heats up' to the point that the population crashes down to zero'; …even in situations, where 'the population changes from high-impact energy source-fossil fuels-to a lower-impact one, solar'.

Climate change is right at the heart of major political and scientific discourses in this century.Pandya (2019) notes that the consequences of climate change may not be immediate, but warns that the ongoing decline of the environment as a result of human activities will ultimately hit back hard in the coming years. Humans, who have remained the major devourers of the Earth's valuable resources and generators of massive wastes, toxins and greenhouse gases, are actually in the right position to prevent this environmental catastrophe. Unfortunately, this clarion call has so far been ignored. It has been noted that the solution lies squarely in the effective communication of climate change and the deployment of pro-people strategies for mobilising popular participation.

Understanding Climate Change Communication

Climate change communication has assumed great importance in our society and especially among social scientists, resulting in what Thompson and Schweizer (2008) refer to as 'the recent explosion of climate change communication from movies to grassroots movements'. On the surface, many people think that climate change communication is all about educating, informing, warning, persuading and mobilising people to solve this critical problem. To them, the simple transmission model of communication is adequate and appropriate. This simplistic model, which describes a one-way process of information sharing with a passive audience, has been seen to be grossly inadequate and ineffective.It has been noted that communicating effectively about a complex, confusing, uncertain and sometimes, an overwhelming topic like climate change can be daunting and challenging, to say the least. For a start, it recognizes the fact that for people to become sufficiently encouraged and empowered to adopt the changes needed to reduce environmental threats, they must be able to understand, interpret and respond to information. This explains why, in many communication contexts, scholars have used a variety of messengers, crafted and transmitted different and sometimes opposing messages, as well as deployed a variety of complex channels to reach diverse audiences, who already hold pre-conceived beliefs and values that may influence how they

interpret and construct meanings from the messages. Climate change communication is about behavioural modifications that empower individuals, communities, and societies to understand processes and act in a manner that positively addresses this critical challenge. It is that communication within a rich, highly complex, and dynamic system of individuals and institutions, with widely divergent views, attitudes, knowledge and cultures. It is through these dynamic processes that climate change communication scientists, scholars, psychologists, political scientists and media practitioners seek to understand, develop and test existing scientific theories, identify and deploy effective communication tools and strategies tomobilise people and institutions as well asgalvanise collective action for eliminating threats to our environment.

Besides the difficulty in mobilising popular participation, it has been noted that other key challenges have continued to impede effective climate change communication. These include the cultural and political conflicts triggered by the phenomenon itself and the psychological barriers that shape people's engagement with the issue. Each of these has serious implications for how best to frame the issue, confront myths and false information in strategic ways that unify, rather than further divide or polarize the various audiences, incorporate existing evidence into outcomes, cultivate the right messages in a manner that highlights sustainable solutions.As earlier noted, climate change is the story of the 21st century; not only about science and environment but also about issues like politics, business, travels, food security and community sustainability among others. The past decade has witnessed an explosion of both academic research and field experimentation on the subject matter.

II. Theoretical Framework

This study is anchored on Agenda Setting theory.

Agenda Setting Theory:

The beginning of agenda-setting theory can be traced to 1922 when Walter Lippmann expresses his concern for the vital role that mass media can play in influencing the setting of a certain image on the mind of the public (Lippmann, 1922). A recent study, however, claims that Bernard Cohen is attributed to reframing Lippmann's ideas into what is referred to as "agenda-setting". According to him, the press is significantly more than a purveyor of information and opinion. In this context, Cohen believes that media may not be successful much of the time in telling people what to think, but it is successful in telling people what to think about. The world, according to him, looks different to different people, depending not only on their interest but also on the map that is drawn for them by writers, editors, publishers and broadcasters. This means that the media audience relies on the interpretative framework put forward to them by the media. The media determine the prominence of events to their audience. The audience learns not only about a given issue, but how much importance to attach to that issue from the frequency of coverage or reportage of an issue by the media. The mass media, therefore, determine important issues by setting the agenda by constant or repeated coverage and reportage of issues (Shaw et al, 1972 as cited in Littlejohn and Foss, 2008).

This theory is usefulin this study because, by regular communication of climate change from all stakeholdersin Nigeria, the right agenda on climate change will be set. When the right agenda is set on climate change communication, there will be collective efforts against climate change in Nigeria.

Research Method

The study employed a qualitative research method. Wimmer and Dominick (2006) think that the qualitative research method is a research method that involves gathering data from notes made while observing in the field, interview transcripts, documents, diaries, and journals. This paper used data gathered from documents on proffering sustainable alternatives to climate change communication in Nigeria. The following proffers sustainable alternatives for climate change communication in Nigeria.

Theoretical Perspectives of Climate Change Communication

Some underlying theoretical principles provide a vital backdrop against which to examine the guidelines for successful climate change communication. These include the following:

Education for Sustainable Development (ESD)

Climate scientists generally agree that all mitigation and adaptation measures must be aligned with the 'three pillars of sustainability which are social, economic and environmental (Monreal&Veulliet, 2010). With the global recognition of education as a 'motor of change' and the declaration by the United Nations General Assembly's (UNGA) Decade of Education for Sustainable Development (ESD), 2005-2014 (UNESCO), the 'fight against global warming' took a centre stage. Underlining the principles of ESD is the clamour for high-quality education that builds the capacity of the people to engage in critical thinking and problem solving, participatory decision-making, as well as the integration of learning experiences into personal and professional life while addressing local and global issues (UNESCO, 2006).

Modern Constructivism

This is a current leading paradigm in learning research that maintains that the process of learning is constructive, self-determined, individual, social, and situated (Terhart, 1999; Kattman, 2003; Widodo, 2004; Mandl, 2006). Underlying this are neurobiological findings, which conclude that the human brain does not simply copy images of the external world, but in fact, draws extensively from time-and energy-intensive processes that repeatedly activate its neuronal structures. Roth (1997) corroborates this and explains that the human brain is not a passive recipient of stimuli, but a pre-determinable system, where individual experiences and existing fore knowledge play a vital role. This indicates that knowledge transfer or sharing formats must be designed in a way that makes construction and re-construction of concepts as well as establishing linkage to the people's foreknowledge possible (Riemeier, 2007). To trigger these effective learning processes,Mandi (2006) concludes that a certain degree of instruction is needed.

Audience Segmentation

Effective communication processes that go beyond conventional scientist-scientist dialogues must draw extensively from knowledge about the targeted audience. Climate change communication research is very recent, yet

a good number of audience segmentation studies and communication case studies have been conducted (Agyeman, et al, 2007; Maibach, et al, 2008; Michaelis, 2007, Leiserowitz, et al). One major conclusion of these studies is that communication must be tailored to appeal to various audiences (Moser, 2007a). Trans-disciplinary approaches have been seen to be very important for gathering insights into the characteristics of the respective target group about climate change, and energy, adapting communication approach as well as framing the message adequately.

Framing

It is very important for climate change communication setting to be framed in such a way as to eliminate any form of manipulation or deceit. Also, messages need to be set within an appropriate context to make credible climate science more accessible to the public (Centre for Research on Environmental Decisions, 2009). While relying extensively on imagery, symbols, and non-verbal cues such as music, tone of voice and gestures, Moser (2010) notes that framing can help communicate why an issue might be a problem, who or what might be responsible, and what should be done to address them. If effectively deployed, frames have the potential to mobilise individuals to action and increase communication choices with critically important implications for persuasiveness, change, attitude, trust and engagement (Green, 2002; Nisbet, 2007; Nisbet, 2009).It must be noted, however, there are several frames for addressing various hindrances against communicating climate change. On the one hand, the local frame perceives climate change impacts as posing a serious problem to flora, fauna and other parts of the world, and not necessarily as a local issue affecting them and their community (Centre for Research on Environment Decisions, 2009). On the other hand, there is the now versus future frame, which highlights situations, where people typically perceive climate change threats as more relevant and urgent than future problems (Weber, 2006). This is contrary to some communicators' portrayal of climate change threats in the future rather than as a present risk. Many scientists maintain that this is the major reason, why it has become increasingly difficult to motivate people to undertake preventative climate change actions.

Message

Communicating climate change science in a way that actively motivates people to act has remained a major challenge. Also, no matter how well the audience is known and how the message is framed, agreeing on what to convey and what to exclude is also daunting. It has been suggested that adopting a multi-perspective approach from a holistic point of view helps resolve this dilemma. According to Moser (2010), the peculiarities of the audience and the messenger, the adopted channels, the location and context as well as the goals and possible barriers of the communication efforts should be considered, when designing the message. This view is consistent with Thogersen's (2004) submission on the extent to which inconsistencies and audience-message mismatches and their attendant cognitive dissonances are likely to undermine the credibility and persuasiveness of the message. The means that there is the need to consider the internal consistency and the connection between the message and existing concepts associated with the audience if effective climate change communication is to be achieved.

Popular Participation

The United Nations through its programme Framework Convention on Climate Change of 1992 (UNFCCC, 1992) initiated the call for parties to promote and facilitate 'public participation in addressing climate

change and its effects and developing adequate responses'. More recent global reports as the IPCC 5th Assessment Report (Stocker et al, 2013), the EU Adaptation Strategy (European Commission, 2013) as well as national (e.g. Austria, Germany) and federal-level (like Province of Tyrol, Austria) have also prioritised participatory approaches for effective climate change communication (Hohenwallner et al, 2014). Moser (2010) acknowledges the great contribution that popular participation can play, but notes that the participation process must be aimed at long-term engagements, as climate change effects may not be easily reversed or quickly 'solved' within human timescales. This underscores the significant role that the level and duration of engagement within the communication activity can play in determining the success of the outcomes (Swart, 2014). To effectively engage and mobilise young people, it has been noted that providing hands-on opportunities that empower them and increase their capacity to become climate action advocates has greater potentials for galvanising their actions (Moser, 2010). These hands-on activities should have a local focus and be strategicallyintegrated into a regular school curriculum to increase the likelihood of successful learning outcomes (Fortner &Duan, 2005). As various studies have shown, the active participation in outdoor activities by high school students (Lisowski&Disinger, 1991) and elementary school students (Erdogan &Erentay, 2007; Erdogan et al, 2010) has continued to increase their understanding of the natural environment. This deliberate linking of the impacts of global phenomena to individual behaviour and actions, not only make abstract concepts tangible but also offers a tremendous opportunity to learn (Jenkins & Jenkins, 2005; Segovia &Galang, 2002).

Principles of Climate Change Communication

Like another complex scientific and societal issues, climate change projections have been plagued by the presence of uncertainty due to outcomes from different climate models. On their part, scientists have attemptedto undermine these uncertainties, choosing rather focus more on other aspects of climate science on which there is sufficient consensus. Yet, there is the need to sustain meaningful dialogue with the public, if they are to be mobilised for collective action. The real challenge here is how to distil research findings, complex scientific data and expert advice into simple, concise messages to engender effective communication with various relevant stakeholders. Some of the tools for achieving these include the following:

- **Leveraging on Visuals**

Experts generally agree that climate change, which is largely associated with distant places like the Arctic Circle, has a big imagery problem that needs to be fully understood and adequately addressed (Land Trust Alliance, 2019). To select the photos and videos that are needed to bring the messages to life, generate awareness and mobilise them to act responsibly has remained a major challenge. It is important to show impacts that are closer home, present responses that are sufficiently localised as well as use models that look like their next-door neighbours. The people's preference for evidence-based resources like visuals underlines the critical importance of engaging contemporary trends such as story-telling, video and visual graphics to convey complicated and 'text-heavy data' (Pandya, 2019). The saying that "a picture speaks a 1000 words' aptly supports the case of using visual communication as an effective way to convey complicated and text-heavy data." (Pandya, 2019). On their part, documentaries have been known to convey very powerful messages hinged on simple and inspiring language

addressing environmental challenges, which encourage people to take the right steps towards mitigating climate change impacts. When handled properly, documentaries can also be used to arouse a sense of urgency in ways that other channels cannot, while delivering persuasive messages of hope and renewed commitment that is needed to make a real difference.

In addition to this, the Land Trust Alliance (2019, states the following as the visual standard of any footage:

● **Faces**

Extensive use of photos that show individuals or small groups of people in real places or situations, experiencing or responding to a climate-change impact. For example, the footages of the family standing in front of their flooded homes with home items floating in the floodwaters. If this is done, viewers are more likely to read the emotions clearly on individual faces and feel their pains at a more personal emotional level.

● **Actions**

Images that adequately capture impacts as well as demonstrate measures that people can feasibly take in their own lives to respond to or prepare for climate change are usually very powerful. For example, neighbourhood, where people are deliberately clearing the drains and opening up waterways for easy flow of rainwater, especially during the rainy season.

● **Contrasting "before-and-after" images**

Contrast is a powerful tool for illustrating a concept that is fundamental to climate change. Like changes over time but difficult to express in words. For example, showing a familiar place before and after flooding, drought and water hyacinth invasion and how the environment is affected by their dramatic impacts can convey a more powerful message.

● **Scale**

While it has been generally accepted that showing climate response on a personal level is very helpful, however, referencing climate responsibility at that level has been known to be counter-productive. What is advisable is to talk about the various degrees to which everyone contributes to exacerbating the problem. For example, while hundreds of fossil-fuel burning cars

maybe contributing to the problem, the homesteads that depend almost exclusively on fuelwood and indiscriminate deforestation are also part of the problem.

- **Social Media:** On the other hand, social media with the plethora of platforms has been seen to transform the way people produce, share and utilise news and data. Various research findings suggest that over 300 million people globally spend over 5 hours daily on social networks; while about 200,000 videos are uploaded to YouTube every day. Despite the increasing impacts that infographics and videos have on media behaviour, climate change advocates are yet to fully leverage the potentials of these modern communication tools.

- **Audience Analysis and Segmentation**

For effective climate change communication, it is very important that we know who our target audience is, understand their underlying beliefs, values and emotions. In the absence of this deliberate segmentation of the target audience, "even the most powerful messages will fall on the deaf ears' (Pandya, 2019) as they will not be sufficiently sensitive to their felt needs. Messages crafted to address a specific audience's need are more likely to incentivise the people to read, understand, recall and readily utilise the information, than generic ones.Audience segmentation also plays a central role in targeted messaging, while deploying marketing principles to assist in selling the technical ideas of climate change and modifying the people's behaviours for the benefit of the society. Given that climate change, at least in part, is rooted in human behaviour, the first step toward establishing effective communication would be to know one's audience. As Pandya (2019) concludes, knowing that climate change is" not on everyone's priority list, to ignore the goals, objectives and behaviours of one's audience, when communicating will invariably be a lost cause".

- **Framing Audience-Specific Messages**

A good understanding of the target audience is key to effective mobilisation for climate change actions needed to mitigate impacts. Pandya (2019) rightly submits that without a good understanding of one's target audience, even the most powerful messages will fall on deaf ears, so first know your audience. Moser (2007a) also notes that appealing to different audiences with tailored communication is an important strategic choice. To achieve a proper audience segmentation, one is required to examine their socio-demographics, understand various influences on their current behaviour, as well as their current thoughts and feelings about climate change. In other words, one needs to be aware of their current knowledge, attitudes and behaviours about climate change and energy in addition to their general socio-demographic aspects that could be used to modify and adapt the communication approach and frame the messages appropriately. Climate change messages that resonate with their underlying beliefs, values and emotions are likely to be read, understood, and remembered than the more generic ones. It has also been generally acknowledged that since climate change, at least in part, is rooted in human behaviour, yet it is still not on everybody's priority list, to ignore the objectives, attitudes and behaviours of the target audience when designing and deploying the communication messages will lead to a mere waste of time.

- **Use of Celebrity Endorsement**

Celebrity endorsement is a powerful tool for drawing attention and arousing interest, especially on social media. Climate change messages, when communicated in a manner that is understandable, pertinent and supported by key influencers like celebrities, are likely to win people's attention and affirmation. Celebrities like former US Vice President Al Gore and Leonardo di Caprio, the 2016 Oscar Awardee, have continued to play an essential role in generating awareness on the issue and shaping people's actions. For example, Leonardo di Caprio's 2016 Oscar's Acceptance speech: "Climate change is real, it is happening right now. It is the most urgent threat facing our entire species and we need to work collectively together and stop procrastinating" touched millions of people across the world and its YouTube video version was viewed more than 18 million times, following high levels of sharing, liking and commenting on social media.Other social influencers from diverse domains, backgrounds and industries have also continued to take critical actions. These include Members of Parliaments, entrepreneurs, journalists,

professionals, advocates, civil society organisations as well as students, who have continued to put the issues on the front burner by spreading the message of environmental issues and advocating for eco-friendly practices. These social influencers know their target audiences well, and by connecting with and engaging them on a more intimate and personal level, they can make deeper and more meaningful impacts. As this awareness grows, people will begin to look upon leaders for guidance and action, as they seek to address the critical issues about their health, well-being and future survival, and to make more life-sustaining strategic decisions about their environment.

- **Design Politically-Motivated Neutral Messages**

People, without a scientific background, often find it difficult to understand the science behind climate change. Yet, it has been globally acknowledged that if there is ever a time to start a new conversation on climate, the time is now. The realities of climate change are experienced by all regardless of your location. The need to address the causes and consequences of unprecedented increases in floods, droughts, wildfires, extreme weather with its negative impacts on people/s health, families and communities has become more urgent. As awareness and concerns about the climate grow, people tend to depend on political leaders to validate or refute the claims. Effective communication should, therefore, be designed to focus on common ground issues and outcomes that are mutually beneficial to the people. It has been recognised that if messages are rooted in universal values and needs, rather than drivers of climate change, people will be readily compelled to make a strong case for adaptation actions intended to sustain our environment, communities and future

- **Use of Trusted Messengers/Spokespersons to Convey Message**

The assumption that ignorance is the root cause of opposition to or apathy about climate change has been challenged by recent findings (Land Trust Alliance, 2019). Various studies have shown that ideology, social identity, and trust have a greater influence on how people seek to understand and accept complex or controversial topics. This means that people's readiness to accept facts is largely dependent on their respect for and trust of the source of the information. Repeated positive interactions are needed to build and sustain this trust over time. It is, therefore, imperative to first identify and engage credible and trusted sources as scientific or natural resource experts, highly respected traditional and religious leaders, as well as opinion leaders within the community to provide evidence and share testimonials.

- **Focus Messages on Climate Change Impacts and Positive Actions**

The ‘big numbers’ of climate change- concentration of atmospheric carbon dioxide, global average temperature targets, etc- are so disconnected from people’s daily experiences. What is critical, therefore, is to deliberately convey a sense of urgency about the immediate consequences of these impacts on lives, livelihoods, ecosystems, and infrastructure. This must be done using clear language and familiar examples, in a way that empowers the people to act to mitigate these impacts and reduce the threats. Any focus on causes may prompt the people to feel that they are being judged for their contributions to climate change problems, and this may alienate them altogether.

- **Communicating with the Right Framing**

Atcheson (2012) citing Slocum (2004) in his thesis states that "There are many criticisms of how the media has covered climate change in the past till date, but there seems to have been many signs of improvement in the way climate change news are covered too. For example, journalists new to the topic may regard climate change as complex and may find it difficult to effectively report on a 'strange' subject. The false balance that has been a problem for years appears to be declining but a catastrophe narrative that disempowers people remains.'

It has also been noted that framing climate change issues in ways that either push the issues out of the conversation or that focus solely on the local effects may not achieve the desired results. While local framing of the issues can present them as manageable objects, this can also lead to over-simplification of what is arguably the most current complex issue of our time and a possible nullification of the significance of what is at stake. As Atcheson (2012) further explains, "While these specific framings might lead to quantifiable desired outcomes (by focusing on heat efficiency or air pollution, for example), it also presents climate change as a manageable object, with energy as a commodity and people as consumers". To enunciate dramatic effects and promote a fatalistic outlook, while neglecting to provide tangible recommendations on how one can begin to respond to such an overwhelming threat (Nisbet, 2009) is very frustrating and disempowering.

An audience must feel they have the ability to do something about the risks they face, otherwise, the potential for emotional numbing is all the more real (Nerlich et al., 2010; Shome& Marx, 2009). Consequently, any messaging that invokes fear of the possibilities arising out of climate change should be balanced with a sense of opportunity to engage (Nerlich et al., 2010; Manzo, 2010). Berkeley psychologists, Robb Willer and Matthew Fienberg provide a strong argument in support of this approach in their recent study, where they highlight the fact that because many Americans believe in a "just-world", they tend to translate this outlook into denial or dismissal of an issue with dire circumstances when no solutions are offered alongside it. This implies that more knowledge can actually lead to increased feelings of apathy; but such message should be presented strategically and alongside a means of changing the undesirable outcomes, to increase the likelihood of participation (Walsh, 2010)

It should be noted that, like the media, the way scientists, politicians and civil society organisations (CSOs) frame climate change also affects how audiences respond. The real challenges include making stories more relevant to audiences, raising the profile of adaptation and the perspectives of the poor, and reporting on ways to address climate change that bring additional benefits" (Walsh, 2010; Nerlich et al, 2010; Manzo, 2010).Hendricks(2017) corroborates this view, when she explains that the frame employed or language used should be tailored scientifically with the right keywords, register and terminology that could drive the message home and inspire a better understanding of actions needed to make a huge difference. In other words, we must change the way we talk about climate change, if we are to affect the way the people think about it and to shape their actions

On the framing techniques to adopt, Kahan(2010) encourages the disentangling of facts from people's identities; while Biologist Andrew Thaler(2017) recommends that we talk about things that are important to people, such as fishing, flooding, farming, faith and the future. It has been noted that when these issues that matter to the people have used an entry into more scientific global issues like global warming, they are likely to see the importance of the scientific evidence to their social group identity, not contradictory to it."(Thaler, 2017)

- **Rephrasing and/or Framing with Metaphor**

Recent work by psychologists Stephen Flusberg, Paul Thibodeau and Teenie, as cited by Hendricks (2017) suggests that the use of metaphors in communicating climate change science can significantly influence people's beliefs and actions. This is evident in the case of conservatives, who shifted their beliefs to be more pro-environmental after seeing satellite images that progressed from the past to the present (past-focused images), rather than from the present to the future (future-focused images).It is also important to note that there is no one-size-fits-all frame for motivating people to take action. Climate change communication needs to focus on the target audience while anticipating their reactions to different messages. These different metaphors matter a great deal in determining how serious global warming is and whether the people would be willing to engage in more pro-environmental behaviours to mitigate its negative impacts.Framing climate change as a "war" against global warming led to greater agreement with scientific evidence showing it is real and human-caused. It also stressed the urgency in reducing emissions, addressing the huge threats that global warming poses as well as galvanising both the political will and collectiveactions needed to change humanbehavioursto reduce their carbon footprint. Hendricks (2017) provides a deeper understanding of the power of metaphors, as she opines that when we encounter war metaphors, we are reminded (though not always consciously) of other war-related concepts like death, destruction, opposition and struggle. These concepts affect our emotions and remind us of the negative feelings and consequences of defeat. Hendricks (2017) further argues that with those war-related thoughts in mind, we may be motivated to avoid losing. If we have these war thoughts swimming around in our minds, when we think about global warming, we are more likely to believe it's important to defeat the opponent, which, in this case, is global warming.

Psychologists such as Kaitlin Raimi, Paul Stern and Alexander Maki draw a strong medical disease analogy between climate change and medical diseases when they suggest that such metaphors pin-point how both risks are often caused or aggravated by human behaviours; the processes are often progressive, even as they produce symptoms outside the normal range of past experiences, as well as generate uncertainties in the prognosis of future events. They also highlight the fact that treatment involves trade-offs or side effects, therefore, the most effective treatment should be directed at the underlying problems, which are hard to reverse, rather than the symptoms.Other psychologists like Matthew Baldwin and JorisLammers, also note that "Climate change messages can also be framed by focusing on different periods, such as in the past, when there were fewer cars and was less traffic, or on future-focused messages on the possibility of increased traffic congestion on our roads. Rephrasing or framing messages in this way has been seen to influence the attitudes of self-identified conservatives and empower them to change how they interact with the planet. Liberals, on the other hand, reported liking the future-focused frame better, but the frames did not influence their environmental attitudes" Hendricks (2017).

- **Deployment of Inter-generational model and Use of Children/Students as Influencers**

Some recent studies in the US suggest that students, who are schooled on the issue of climate change by a team of social scientists and ecologists are likely to become ideal influencers of their parents and peers (Denworth, 2019). The evidence of this pass-through effect prompts experts to conclude that conversations between generations may be an effective starting point in combating the effects of a warming environment.

Denworth (2019) corroborates this when she explains that "This model of intergenerational learning provides a dual benefit"… as it prepares kids for the future since they're going to deal with the brunt of climate change's impact. Denworth (2019) further explains that this empowers them to help make a difference on the issue now by providing them with a structure to have conversations with older generations to bring us together to work on climate change. She further argues that students/children can increase their parents' level of concern about climate change because, unlike adults, their views on the issue do not generally reflect any entrenched political ideology. Parents also really do care what their children think, even on socially-charged issues like climate change or sexual orientation revealed a shift in their elders' attitudes. Researchers, like Nicole Holthus, cited by Denworth (2019) agree that this inter-generational model certainly provides 'a promising avenue for those of us in climate change education'.By engaging child-to-parent transfer of knowledge, they further note that they are achieving good results despite the obvious difficulty that the socio-political aspects of climate change create for people"

Lawson (2019) believes that conversations about climate change were easier because of the level of trust between parents and their children. This is not necessarily the case with two adults talking to each other. The success of the current advocacy work tagged "School Strike for Climate" by the Swedish teenager, Greta Thunberg promptsDenworth (2019) to note "that if we can promote this community-building and conversation-building on climate change, we can come together and work together on a solution." Any commitment to leveraging on these inter-generational relationships can be very productive and mutually-rewarding for both children and elders. As children advocate for their future, they are also effectively advocating for their parents in a mutually-respectful and rewarding way.

- **Media Coverage of Climate Change**

Sustained media exposure and coverage of climate change have had great effects on public perception of the issue (Antilla, 2010). As always, the media have been known to play a pivotalrole in public education on climate change, as well as to induce and bringabout a positive contribution to our understanding of the seriousness of the issue.Although climate changeseems to havegained popularity in recent years through mainstream media, yet the fact remains there are still limitations to the full knowledge dissemination by the mass media, pressreleases, research pieces and government regulations, which, according to scientists, are still grossly inadequate and feeble in tackling the urgency in the fight against climate change. Carvalhoand Burgess (2005) note that themedia report on climate change in the United States has been widely studied, as some other studies on reportage of climate change in other countries have been less expansive. Other studies also showed that while in the United States and the UK tabloid press and the media have demonstrated significant understanding of the issues and good mastery of how best to harness the strength of scientific consensus on climate change, other countries are still lagging far behind (IPCC Assessment Reports, 1995; 2001). It has been noted that in early 2007, media coverage of climate change reached a significant height, but by 2017, media attention on climate change and global warming ebbed with June seeing the maximum global media coverage on both subjects. The reason for this was attributed to news surrounding United States President Donald J. Trump's withdrawal from the 2015 United Nations (UN) Paris Climate Agreement, with continuing media attention paid to the emergent US isolation following through the G7 Summit a few weeks later (Ereaut, and Sergrit, 2006)

Some researchers and journalists believe that media coverage of political issues is adequate and fair, while a few feel that it is biased(Feindt, P and Oels, A; 2005).As McCombs et al.'s (1972) study of the political function of mass media revealed, media coverage of an issue can "play an important part in shaping political reality" (Sampei, Y and Aoyagi-Usui, M. (2009). Research into media coverage of climate change has demonstrated the significant role of the media in determining climate policy formation (Stenport, A.W, et al; 2017). Others like McKibben (2018) insist that "the media has considerable bearing on public opinion, and how issues are reported or framed, establishes a particular discourse." On the significant role that the media can play, it has been noted that media coverage of climate change (particularly in tabloid journalism but also more generally), is concentrated around extreme weather events and projections of catastrophe, creating "a language of imminent terror"(Pooley, 2010) which, as some commentators argue, has instilled policy-paralysis and inhibited response. Consequently, Moser et al(2010) suggest using solution-orientated frames, which inspire action to solve climate change, contrary to Schneider's(2011) insistence on the predominance of catastrophe frame, which may be useful in explaining the apparent value-action gap with climate change and generating discourses on the issue, but not necessarily inspiring action(Singer, E. and Endreny, P.M., 1993).Regardless of this divergent view on the media, experts agree that the ever-strengthening scientific consensus on climate change means that scepticism is becoming less prevalent in the media (Parenti, 1993).

Social Mobilisation through Mass Media

All too often, media campaigns have been projected as the most effective wayto reach the wide audiences needed for mobilisation around climate change without paying serious attention to their peculiarities. However, Moser (2009a, 2010) notes that the appeal ofreaching a large heterogeneous audience through television, newspapers, and the internet tempts us to overlook thefact that information passed along through mediated channels is often 'consumed' withoutgreat attention, quickly discarded or ignored. It also tends to ignore the fact that structuralchanges occurring in the media landscape also affect the quality and diversity of news, andsocial divide (Moser, 2010); yet the assumed goal of most communication onclimate change is not only to reach an audience but to actively engage people. Understanding the effectiveness of different channels is, therefore, critically important.Ochieng (2009) insists that "the media can play a critical role in reinforcing efforts to mainstream climate change adaptation into development planning and policy. Not only is it the major source of information to the citizenry, but the media also plays an important role in shaping public policy debate and informing decision-makers through newspapers, radio and television.Unfortunately, journalists, especially those in the developing world, are not sufficiently equipped to process and effectively communicate climate change information". This observation holds even in the face of increasing commitment to environmental reporting as an important genre of journalism. As Ochieng (2009) further explains, even though the environment is still rarely a front-page news item, yet environmental consciousness within newsrooms continues to rise, to the extent that such environmental issues as climate change that once sounded like apocalyptic threats hardly go unnoticed by an informed editor today. No doubt, these current challenges and shifts place a heavy burden on the modern-day environmental journalist. This problem is further compounded by the absence of specialization in many newsrooms and the difficult task of reporting on technical environmental stories like climate change issues (Ochieng, 2009)

Challenges of Climate Change Communication

A closer examination of the principles and tools needed to communicate climate change, mobilise popular participation and galvanise collective action pinpoints some of the critical changes in climate change communication. These include:

The difficulty of building synergistic relationships

The suspected tense relations between scientists, journalists and policy-makers are perceived as a critical barrier to ensuring effective communication and influence on policy. The three groups perceive each other to have different world views, timeframes for action, and motivations.According to Ochieng, (2008), policymakers accuse scientists of providing overly-technical and inaccessible information, and of taking a very long time to deliver their research results in a simple form that can aid decision making. Many scientists feel more comfortable discussing freely with their peers, but not so comfortable engaging non-peers in the policy and media arenas (Ochieng, 2009), Scientists, on the other hand, think that policy-makers pander too much to political and vote-seeking imperatives to the detriment of sound science and information. They are also seen to lack patience, to rarely take time to fully understand scientific advice, as well as to appreciate -rather than despise- the role of science and research in decision-making (Ochieng, 2009).

As for the journalists, because of the peculiarity of their profession, scientists and policy-makers largely regard them as masters of sensationalism, who always emphasize irrelevant issues at the expense of important research and policy agenda. As a result, policymakers and scientists often intentionally exclude journalistsfrom decision-making and research. These attitudes, according to Ochieng (2009), have generated so much mistrust and scepticismamong journalists, policy-makers and scientists, resulting in poor communication and undermining of the effectiveness of development planning and policy.

What is needed is, for sources' stakeholders (including researchers, policy-makers and journalists) is to positively create opportunities for interaction between each other to improve science and climate change communication. This requires new mechanisms for interaction, participatory learning and action, such as forums, 'town hall' meetings that sustain dialogue among them

Poor Communication of Climate Science

Not only are a majority of scientists poor atexplaining their work in a simple way that even non-experts can understand, but they are also verysensitive about how their policy judgments might be regarded by their scientific colleagues. Yetreporters, the public, and policymakers are usually more interested in the policy relevance oftheir science. In other words, "impact stories" are the best ways to engage the public and promotescience communication. For reporters, policy-makers and the public, it is more newsworthy togive research information about real-life implications of how people and places are affected by climate change and what needs to be done to promote adaptation as opposed to generalatmospheric science of climate change.

The way out, as expressed in the Communique Report (….) on 'Communication of Science and Climate Change Information' is for researchers to seek to communicate outside the usual realm of scientific papers by involving the media at all stages of the research development, as well as using means like policy briefs to engage broad audiences. It was also noted that researchers should not abandon their work after it is published. Instead, they should become champions for it, pursuing dialogue with policy-makers. It is hoped that this could eventually lead to researchers, journalists and policy-makers working together on producing a dissemination strategy. The need to train scientists in communication to enable them to take greater responsibility in getting their stories out to the public, the media and policy-makers were stressed.

Intellectual Property Rights Concerns

Most scientists often express great concerns about possible breaches of their intellectual property rights by journalists, especially in their presentations, at public fora, workshops and seminars. Often they take pictures, present recorded materials, and publish scientific facts without permission or in deference to the scientists for confirmation of available information. Ochieng (2009) notes that this may not deny the researchers their due benefits, but can also sometimes undermine their credibility among peers. This underscores the need for greater consultations between journalists and scientists in the course of research and publication of materials. On their part, journalists also need to be careful to ensure the accuracy of their reports as well as protection of the researchers' intellectual property rights.

The dearth of Good Journalism Skills

A good grounding in journalism fundamentals cannot be over-emphasized. This is even more imperative in ensuring effective and responsible reporting on complex science issues like climate change. In addition to relevant skills in conducting research, journalists are expected to master interviewing and good networking skills to reach the right contacts quickly, when on deadline (Ochieng, 2009).

It is also generally acknowledged that experienced science reporters with extensive networks of well-cultivated contacts secure interviews and access to important sources faster than young reporters. Also, it has been noted that many still have difficulty in maintaining full range of science issues; many newsrooms only maintain general assignment reporters; even as those on special assignments are never maintained long enough on a beat to hone their skills and increase their understanding in climate change subjects. These challenges are further compounded by lack of time and space in many media outlets to cover a particular science-based issue (Ochieng, 2009)

There is also the need for journalists to be trained on basic concepts and fundamentals of climate change science adaptation issues; as well as to understand the scientific research fundamentals like the scientific method, interpretation of numbers and statistics, and the significance of peer review. Ochieng (2009) cautions that scientists and policymakers could do well to be less apprehensive, if not repulsive, about interviews with journalists. On their part, public institutions and government agencies should adopt and maintain an open door and proactive policy to make the public understand their work. Journalists are expected to leverage on such opportunities to make more news; as more researchers are expected to take a proactive role in trying to communicate their work

Leveraging Increased Interest in the Environment

Increased public interest in the environment has led to a greater willingness to cover science and environmental news by the media. However, there is yet to be well-developed strong policy within the media to promote science andenvironmental news coverage. Experts note that overall, there is a lot of traction for the environment, but it is not yet directly related to the needs and values of the audience. Even policymakers have been seen to lag behind the public on the concern for the environment (Ochieng, 2009).

As a way of addressing this concern, journalists are encouraged to find ways to domesticate the big global debate on the environment to make them sufficiently responsive to the growing people's concern for their environment. For example, when newspaper headlines are tailored to different regions and environmental issues are packaged in such a way that they relate to their daily lives, the bigger global debate becomes less overwhelming and daunting. It may also be possible to do likewise with environmental and climate change adaptation stories, in a manner that would make the news more relevant to specific audiences.

Promoting public participation in climate change

Nations have legal duty and responsibility to promote public participation in the implementation of their climate change actions, yet they fail to do so. As Duyck (2018) explains, "The 2015 Paris Climate Agreement was celebrated not only for bringing together all countries around the urgency of climate action but also for emphasising the importance of people-centred climate action. Ensuring the effectiveness and meaningful public participation of the climate-related decision-making is very important in ensuring that policies are designed in a way that protects and respects the rights of the public and contributes to gender equality and social justice. It is also very effective for strengthening public support for climate measures and delivering better results in reducing emissions and improving public' resilience to climate change (Duyck, 2018). He summarised this global obligation by noting that:

> *Every year the international community come together to reinforce the rules for putting the Paris Agreement into action in 196 countries. The implementation of these guidelines offer many opportunities for the governments of each nation to reaffirm the need for public participation on their respective climate policies at the domestic level. For instance, the decisions approved from those meetings stress that countries must develop their future national climate commitments through a transparent and participatory process. They could also make the civil society to help monitor governments' actions to ensure they are honoring their commitments to their obligation.*

It was also further agreed that "as governments elaborate rules for international trading in carbon credits, they should ensure that local communities participate throughout theplanning and development of any project promoted through these schemes and offer adequate remedies when this is not the case" (Duyck, 2018). This position makes it obligatory for all these countries, which have ratified the Aarhus Convention on Public Participation in Environmental Decision-Making, not only to respect the right of the public to participate in climate negotiations but also to champion the recognition of this right in the decisions adopted in the UN climate conferences.

Building Synergies among Key Stakeholders

All key stakeholders must understand that for proper measures and plan to be taken to mitigate climate change and environmental impacts, proactive and urgent steps first must be taken to reduce pollution and the emissions of greenhouse gases that cause climate change in our world. This means that the approach must be concrete and practical, to ensure that real improvements to our climate and environment are made. It must also include tough measures to increase the range of energy-efficient products as well as improve the air we breathe indoors. This means that a synergistic relationship among the key stakeholders-national governments, government agencies, non-governmental organisations, communities, and individuals- must be built and sustained over time. Everyone needs to actively participate in actions and steps that may be taken to ensure that impacts of greenhouse gases and air pollutions are drastically reduced in a way that allows national economies to grow and prosper.

III. Conclusion/Recommendation

History is replete with evidence of the world's most effective communicators and their successes in galvanising masses to win wars, lead revolutions, secure human rights, and foster growth and innovation through the power of language and communication. Engaging people with clear and simplified information has remained a major challenge for the scientific community. Instead of inundating people with piles of scientific information, the real focus should be on the effective presentation of evidence in a way that actively engages people and motivates them to act. This task of effectively communicating climate change is, however, not limited to scientists and environmentalists only, but other key actors/stakeholders including governments, individuals, NGOs, social influencers and enterprises, all of whom have very crucial roles to play in adequately addressing this global phenomenon.

Despite this urgent need to mobilise collective actions necessary to mitigate emissions, many people refrain from talking about climate change, resulting in what the sociologists refer to as a 'socially-constructed silence' (Dryzeketal., 2011). Everyone needs to speak up about climate change to break this collective silence and to increase public awareness of the human-caused problem and engender support for climate solutions. Also, the messages need to be conveyed with vivid, emotive and human stories that can elicit positive emotions and support social norms of the people. All of these underscore the real challenge in climate change communication.

Language has remained a very powerful tool for effective communication of climate change. To motivate and galvanise collective action needed to reduce environmental threats, people must be able to interpret and respond

to information shared. Also, messages must be packaged in such a way that they are engaging and thought-provoking; as well as designed to inform, instruct and inspire sustained .group action. However, this is not often easy to accomplish, as communicating complex and confusing topics, like climate change, is often overwhelming, emotionally-draining and politically-challenging. No doubt, there is a lot of work to be done in popular participation that is effective enough to mobilise stakeholders politically, generate widespread support for initiatives to cut emissions.It is also very important to encourage innovative technologies and clean energy development, as well as assist our local communities to initiate and adopt more fossil-fuel sustainable lifestyles with potentials to safeguard our future and build more resilient communities.

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