Climate Change Communication in South East Nigeria: Analyzing Perspectives

Ifeanyichukwu Ekeka
Alpha Radio 106.5Fm, Nnobi, Anambra State, Nigeria
aifyekekam@gmail.com
and
Chinonso Chinaemerem Adikuru
Department of Mass Communication,
Chukwuemeka Odumegwu Ojukwu University,
Igbariam, Anambra State, Nigeria
cc.adikuru@coou.edu.ng

Abstract

Climate Change is one of the major concerns of nations in the 21st century. The Intergovernmental Panel on Climate Change (IPCC) characterizes it as the latest challenge to sustainable human development. Nigeria, as a nation, is particularly vulnerable to climate change because a large share of its economy is dependent on climate-sensitive natural resources, and there is low level of adaptation measures due to poverty and low technological development. This has necessitated intervention measures communicated by the government and non-governmental organizations (NGOs) through various media such as radio, television, video, newspapers, magazines and new media to ameliorate the impact of climate change. The paper, therefore, is a theoretical review of the climate change in Nigeria. The paper adopts Mental Model to analyze different perspectives of climate change communication in Nigeria. Climate change, impact of climate change, climate change and variability as well as climate change adaptation and prevention are discussed as key issues on climate change communication in Nigeria. Against the backdrop of these analyses, the paper recommended that efforts be made by all concerned bodies on climate change intervention to review the content of the messages for clearer and better understanding to audience. Additionally, there should be creation of communication strategies that would address the major issues of climate change geared towards the achievement of a wider coverage of climate change interventions in the country in meeting the SDG goals.

Keywords: climate, climate change, communication, adaptation and prevention.

Introduction

The issue of climate change took a global dimension as a result of the manifestations in variations of different climate parameters and is related to the pattern of weather condition in particular places which include cloud cover, precipitation, temperature ranges, rising sea levels and vapour (Ministry of Environment, Federal Republic of Nigeria (MOEFRN), 2003, p.43).

There is some evidence from studies like BNRCC (Building Nigeria's Response to Climate Change, 2011, p.1); Odjugo (2010); Nwafor (2007) and Jagtap (2007) that climate change is likely to have negative impact on the efforts to achieve Nigeria's development objectives, including the targets set out in Nigeria Vision 2020 and the Sustainable Development Goals (SDG), number 13: "Take urgent action to combat climate change and its impact".

In 2012, Nigeria experienced one of the worst devastating effects of climate change which resulted in flooding in most parts of the country. Following the incident, government and concerned bodies sent out a flurry of messages on climate change intervention measures targeted more at the vulnerable communities to ameliorate the effects of climate change.

The intervention measures on climate change are geared towards the goal of reducing the impact of climate change by having a positive behavior change emanating as a result of the audience knowledge of the adaptation and mitigation actions disseminated through various medium such as the radio, television, video, printed materials, interpersonal communication and new media.

This shows that in Nigeria like every other nation, communication has a big role to play in telling the audience ways in which they can adapt or mitigate the impact of climate change. Audience response to those messages on climate change intervention messages on climate change intervention measures relies heavily on the climate change communication channels.

The Climate Change Performance Index Results 2014 (Burck, Marten &Bals, 2013) indicated that no single country is yet on track to prevent the dangers posed by climate change. Arising from

the above, this study tends to investigate the audience perspectives and response to the intervention measures on climate change communication in South East, Nigeria.

Climate change operates over decades or longer. Changes in climate occur as a result of both internal variability within the climate system and external factors (both natural and anthropogenic). The climate record clearly shows that climate is always changing. One feature of the record is that climate over the past 10,000 years has been both warm and relatively stable (Albritton, 2001).

Past changes could not be observed directly, but are inferred through a variety of proxy records such as ice cores and tree rings. Such records can be used to make inferences about climate and atmospheric composition extending back as far as 400,000 years. These data indicate that the range of natural climate variability is in excess of several degrees Celsius on local and regional spatial scales over periods as short as a decade (Albritton, 2001). Precipitation also has varied widely.

The Effects of Climate on the Transmission of Human Diseases

Climate change involves a change in both the mean meteorological values and variability of these values. The anticipated change in mean climatic conditions is expected to be a slow process, occurring over many decades. Climate variability, however, occurs on a time-scale from weeks or months (e.g. storms and floods) to years (e.g. the ENSO cycle, oscillating with an approximately 5-year periodicity).

The health impacts of climate variability are, in general, likely to be more pronounced over the near term than are those of climate change. For example, large anomalies in temperature and rainfall in a particular season could cause a number of vector-borne and water-borne epidemics, thereafter the weather could return to normal. Extremes of heat can cause heat exhaustion, cardiovascular disease (heart attacks and strokes) while cold spells can lead to hypothermia and increase morbidity and mortality from cardiovascular disease. Storms, tropical cyclones and extreme rainfall can cause immediate death and injuries, as well as

increased risk of water-borne diseases in the medium-term and psychological stress on affected communities in the long-term.

Slow changes in climatic conditions may allow human populations time to adapt. For example, people or communities may develop new ways of coping with, or attenuating, rising residential temperatures. In contrast, abrupt climate changes due to anomalous seasonal climate variability do not allow such opportunities.

The complexities of interactions between environment and host are best shown by the example of vector-borne diseases. The success of pathogens and vectors is determined partly by their reproductive rate. Malaria-carrying mosquito populations can increase tremendously within a very short time. Equally the plasmodium parasite species proliferates rapidly in both mosquito and human hosts. In contrast, tsetse flies have a low reproductive rate and their populations take much longer to increase under favourable conditions. Hence, infectious diseases transmitted by the tsetse fly (including human sleeping sickness) respond less rapidly to variations in climate than do many mosquito-borne infections.

Vectors' ability to transmit disease is also affected by feeding frequency. Hard ticks (such as the vectors of Lyme disease) feed more frequently and for shorter periods than soft ticks. Hard ticks therefore tend to be much more efficient vectors of human diseases. Overall, high vector and pathogen reproductive capacity; preference for humans as a source of blood meals; low life cycle complexity; and high sensitivity to temperature changes result in an infectious disease that has high sensitivity to climate variability.

While climate and environmental factors often initiate changes in the rate of disease (e.g. triggering an epidemic) health service interventions often play a major role in containing the spread of disease. Therefore, in disease outbreaks it is often unclear whether the outcome is a result of either altered climatic and environmental conditions or intervention failures. This is an example of the general problem, it is known that climate has an effect on infections and other health problems but it is difficult to tell how much disease and injury can be attributed to this factor.

Mathematical models provide one important means to answer the "what if?" question about the future effects of climate change on infectious disease occurrence.

Both biologically based and statistical-empirical models have been used in recent years. More sophisticated integrated models are being developed to take into account the effects of other determinants such as economics and human behaviour. Historical examples of the health correlates of climate variability, such as the El Niño phenomenon, also provide insights into possible future climate and health scenarios.

The traditional role of surveillance in epidemiological assessment of diseases may not stand up to the speed with which epidemics evolve under climate change. Quite often it is difficult to tell whether a rise in the number of cases of malaria is simply normal seasonal variation or the beginning of a large-scale epidemic.

At first the number of cases grows slowly, but may rapidly move into a phase of exponential growth, in which case the health care system may be over-whelmed. Hence, the value of disease forecasting methods that can estimate the size of a developing epidemic depending on the level of climate anomaly.

Impact of Climate Change in South East Nigeria

In South East Nigeria, the inhabitants are faced with the great climate change impact such as erosion, flooding and landscape (Ogbozor, 2002). These impacts of climate change threaten water resources, agriculture, land use, energy, biodiversity and health which have led to loss of lives and properties of people of the area.

Erosion

The formation of gullies has become one of the greatest environmental disasters facing many towns and villages in South East, Nigeria (Okpala, 1990). Erosion by its nature is one of the geomorphologic process that affects an area and is the wearing away of soil particles as a result of flood or runoff (Goudie, 1990). The erosive impact of runoff on the soil is incremental and, if not prevented or controlled, leads to the various forms of erosion, the best known, and most destructive of which, in South East, is the

gully type. The World Bank assisted project – Nigeria Erosion and Watershed Management Project, (Anambra NEWMAP, 2015), describes the two types of erosion acing the people of South East as the Sheet Erosion and Gully Erosion.

According to the document, sheet erosion occurs when the flooding spreads over wide areas, cutting slopes and creating uneven sharing of the soil and that when foothpaths become lower or deeper, tree roots or house foundations become exposed, or road shoulders become lower than the road-edge, it is usually as a result of sheet erosion. However, gully erosion is visually the impressive of all types of erosion (El-Swaify, 1990). Abdulfatai, Okunola, Akande, Momoh and Ibrahim citing (Monkhouse and Small, 1978) describes gully erosion as a well-defined water worn channel that normally starts as negligible cuts across landscapes called rills.

Flooding

Floods are the most common, recurring and widespread occurrence in the world, but the origin of a given flood is not always clearly delineated (Pielke and Klein, 2005). The impact of flooding are felt all over the world and results in loss of lives, disrupt economic and social activities (Aderogba, 2012).

In 2012 and 2017, flooding became a widespread occurrence across the 36 states of the federation including the South East, Nigeria. Ever since 2012 flood disaster, the citizenry particularly the people of South East and especially those living in the flood-prone areas, have always been living in fear or anxiously agitated every rainy season for fear of recurrence of the deluge which ravaged their places of domicile years ago. This fears and anxieties are not helped by the constant or yearly predictions since then by the Nigerian Meteorological Institute (NIMET) of the probability of another flood disaster (NIMET, 2015 and 2017).

Adaptation, Climate Impacts, and Vulnerability Assessment

In order to assess health impacts of, and vulnerability to, climate change and variability, it is essential to consider adaptation (IPCC). The ultimate objective of the United Nations Framework Convention on Climate Change (UNFCCC) is “to achieve

stabilization of atmospheric concentrations of greenhouse gases at levels that would prevent dangerous anthropogenic (human-induced) interference with the climate system . . .” However, the UNFCCC does not define dangerous levels, although it does refer to levels that “allow ecosystems to adapt, ensure food production is not threatened, and enable economic development to proceed in a sustainable manner”. As human population health also depends on these factors, it can serve as an important integrating index of effects of climate change on ecosystems, food supplies, and social-economic development (IPCC). The extent to which the health of human population is vulnerable to climate change depends on the direct and indirect exposures of human populations (e.g. through disturbances ecosystems, disruptions in agriculture) to climate change effects, the populations’ sensitivity to the exposure, and the affected systems’ ability to adapt.

To assess the human health risks associated with climate change, impact and vulnerability assessments must address adaptation. Adaptation is considered both in the assessment of impacts and vulnerabilities and as a response option (IPCC). Due to the past accumulation of greenhouse gases (atmospheric concentrations of CO2 have increased 31% since 1750), the long lifetimes of these gases and the thermal inertia of the climate system, it is likely that global temperatures will increase and other aspects of climate continue to change regardless of the coordinated international mitigation actions undertaken (Kovatz, 2000; Wigley, 1999). Further, it is unlikely that autonomous actions undertaken by individuals or countries in reaction to climate health impacts will fully ameliorate all impacts (they don’t now) (IPCC; Scheraga, Grambsch, 1998). As a result, it is prudent to develop planned adaptation strategies that address future changes in climate and impacts. Article 4.1 of the UNFCCC commits parties to formulate and implement national and, where appropriate, regional programmes of “measures to facilitate adequate adaptation to climate change”.

Although climate impact and vulnerability studies consider adaptation, they rarely do more than identify potential adaptation options or model them in a simple way, relying on a number of

simplifying assumptions.

Climate Adaptation and Prevention

Many of the adaptive measures discussed in health impact and IPCC identified rebuilding public health infrastructure as "the most important, cost-effective and urgently needed" adaptation strategy (IPCC). Other measures endorsed by the IPCC include public health training programmes; more effective surveillance and emergency response systems; and sustainable prevention and control programmes. These measures are familiar to the public health community and needed regardless of whether or not climate changes: they constitute the basis of a "no-regrets" adaptation strategy.

Adaptive actions to reduce health impacts can be considered in terms of the conventional public health categories of primary, secondary, and tertiary prevention (Patz, 1996; Kovats, 2000; McMichael, 2000). Primary prevention refers to an intervention implemented before there is evidence of disease or injury: avoiding hazardous exposure, removing causative risk factors or protecting individuals so that exposure to the hazard is of no consequence. For example, bed nets can be supplied to populations at risk of exposure to malaria and early warning systems (e.g. extreme health warnings, famine early warning) established to provide information on hazards and recommended actions to avoid or reduce risks. Primary prevention largely corresponds to anticipatory adaptation.

Secondary prevention involves intervention implemented after disease has begun, but before it is symptomatic (e.g. early detection or screening), and sub-sequent treatment that averts full progression to disease. Examples include enhancing monitoring and surveillance; improving disaster response and recovery; and strengthening the public health system's ability to respond quickly to disease outbreaks. Secondary prevention is analogous to reactive adaptation.

Finally, tertiary prevention attempts to minimize the adverse effects of an already present disease or injury (e.g. better treatment of heat stroke, improved diagnosis of vector-borne diseases). As

the adverse health outcome is not prevented, tertiary prevention is inherently reactive.

Climate-related adaptation strategies should not be considered in isolation of broader public health concerns such as population growth and demographic change; poverty; public health infrastructure; sanitation, availability of health care; nutrition; dangerous personal behaviours; misuse of antibiotics; pesticide resistance; and environmental degradation (Patz, 2000). All of these factors (and others) will influence the vulnerability of populations and the health impacts they experience, as well as possible adaptation strategies.

Oginni and Adebamowo (2013) in a study of evaluation of the socio-cultural effects of climate change on vulnerable Africa: making a case for urgent action towards Adaptation in Nigeria using survey and interviews recommend for immediate actions on measures of adaptation by which the vulnerable people could be made resilient in the face of this crisis thereby reducing significantly the risks of climate change.

In a study by Anagbogu, Nwokolo and Anyamene (2014) on school children's perception of climate change and possible remediation looked at the young school children's views on the strategies of reducing impacts and effects of climate change in schools and communities which was based on the lessons learnt from Environmental Education and counseling programmes carried out in some selected secondary schools in Anambra State, Nigeria within the period 2009-2012. Their study sample consisted of 600 students selected through simple random sampling. The findings of their study revealed that all the strategies are capable of reducing impact and effects of climate change. Based on the findings, they recommended among other things that school children should participate in decision making in schools, homes and communities. This study also will reveal the strategies that can reduce impacts and effects of climate change. It will further establish the communication platforms through which the audiences receive such information as well as how they respond to such information.

A study of farming practices in Southeast Nigeria finds that

farmers on their own and with the help of government and other intervention agencies are already adapting to climate change, particularly farmers in the South-south zone (Ifeanyi-obi and Nnadi, 2014). It recommends that adaptation measures, such as improvement in farm input and movement toward more disease resistant crop varieties, are further supported (Ifeanyi-obi and Nnadi, 2014).

A study of adaptation measures in Imo state in Southeast Nigeria also reveals that farmers have devised various ways to reduce the effects of climate change (Okoroh et al., 2016). These include: crop rotation, mixed cropping practices and the use of water channels as draining systems, mulching, regular weeding and conservation of soil moisture through appropriate tillage operation – all of which have been undertaken by more than half of the farmers studied (Okoroh et al., 2016).

A study, focused on Oyo and Ekiti States in Southwest Nigeria finds that farmers use various climate change adaptation strategies, including (in order of popularity) fertilizer application; mixed cropping; cultivation of improved varieties; mulching; altering of crop planting date and planting of crop cover (Oluwole et al., 2016). The variation in the type of strategies adopted among farmers can be attributed to differences in access to capital, information on the use of different climate change adaptation strategies and type of arable crop grown by the individual farmers (Oluwole et al., 2016). Another study conducted in Southwest Nigeria finds that crop cover is proving to be effective in conserving soil and protecting against climatic factors, such as excessive heat/dry spell, heavy and erratic rainfall and erosion (Enete et al., 2015).

Means of Communication

Decisions related to where, when, and how to communicate a campaign message can be just as important as decisions about the message itself. This means that it is important to determine the best and most appropriate means to reach the target audience, as well as gauge the feasibility of these means in the context of the population under study. It also means considering a wide variety of

available media and resources as part of the dissemination strategy for the campaign.

Today, there are many more mechanisms that can be used to advertise, distribute, and display campaign messages including, social media, print ads, Public Service Announcements (PSAs), television, radio and internet ads, to name a few. Each type of communication has its advantages and disadvantages. For example, Delhomme et al. (2009) found that TV is the most cost effective means to reach a large audience and can easily disseminate complex messages.

On the other hand, outdoor media was found to have high exposure, long lifespan, and low costs but also low information capacity. Communities using these approaches should choose locations with high traffic flow among the target audience. Social media has also been touted as a free and effective means of delivering campaign messages that can reach a wide audience. However, this approach also requires access to a computer or internet-capable device, and may be less effective for older audiences (Baglo et al. 2013) who may be less likely to use these tools. Determining the appropriateness and estimated effectiveness of a particular method of communication relies on several factors. Such factors can include:

- consideration of the social and behavioural characteristics of the target audience (e.g., younger audiences may be more receptive to social media communication than older adults);
- complexity of the message;
- time and location in which the targeted behaviour takes place; and,
- the cost of implementation.

Moreover, Radio and outdoor advertising, such as signs along roadways, would be particularly relevant to local road safety messages since they provide the best opportunity to deliver messages as the targeted behaviour (i.e., driving) occurs (Wundersitz et al. 2010).

From the literature, it is observed that for a successful climate change communication to be achieved, various communication channels must be employed in order to reach the targeted audience (Penprapa, 2012).

Theoretical Foundation

Mental Model

The theory of mental model owes its origins to Peirce's logic in the nineteenth century and to Craik's psychological research during the Second World War. The principal assumption of the theory is that individuals reason by trying to envisage the possibilities compatible with what they know or believe.

A Mental Model is a conceptual representation within a person's mind that helps the person to understand the world and interact with the world. The Mental Model explains the environment to the people in such a way that they can better understand it which invariably forms the way they perceive the world and how they interact with the world. It attempts to explain how environmental information in a person's mind can help the person to understand better the world, reacting to such information which can lead to behavior change.

Mental Model is a psychological representation that has the same relational structure as what it represents. They have been invoked to explain many important aspects of human reasoning including deduction, induction, problem solving, language understanding, and human-machine interaction. However, the success of Mental Model in those areas has not left it without its critics.

According to Preece, Rogers, Sharp, Benyon, Holland and Carey, (1994) Mental Models are applicable in many situations, but the diversity of definitions and the lack of a coherent methodology may cause confusion and may result in contradictory results. They further said that it appears that most researchers develop their own methodology based on the verbal protocol analysis. This type of analysis may contain significant bias introduced by the experimenter's interpretation. This experimenter's interpretation provides the user with a more clear start in understanding an issue

which is part of the arguments of the Mental Model.

Recommendations

The study recommends the following:

- In terms of the content of climate change intervention messages, this study recommends that further efforts be made by all concerned bodies on climate change intervention to review the content of the messages for clearer and better understanding to the audience. This will address the issue of communicating climate change intervention measures in an unclear and ambiguous manner.
- There is need for the creation of communication strategies that would address the major issues of climate change intervention geared towards the achievement of a wider coverage of climate change interventions in the country in meeting the SDG goals.
- Government should ensure proper and full implementation of policies on climate intervention measures through its concerned agencies and bodies towards adaptation and mitigation of climate change in the country.

Conclusion

The role of communication in providing information relating to the environment to produce desirable behavior change in a target group has been a dominant discourse in many countries. The use of various communication platforms in disseminating environmental information has been the basis for the conception of environmental communication and has been gaining a lot of foothold in recent years, especially at a time when the issue of climate change has become the latest challenge to sustainable human development and one of the major environmental concerns of nations in the 21st century. This study therefore focused on the application of Mental Model to evaluate how the audience interpret their environment and make prompt decisions on climate change.

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