



IMPACTS OF CLIMATE CHANGE ON THE GLOBAL SCALE, WITH SPECIAL FOCUS ON CURRICULUM REVIEW ON TEACHING AND LERNING IN EDUCATIONAL INSTITUTIONS IN NIGERIA: PSYCHOLOGICAL IMPLICATIONS

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Abstract

The global impacts of climate change have been lingering in the minds of individual and the worrisome consequences have being the concern of victims, governments, educationists, educators, non-governmental organizations, researchers and various professionals. This paper is therefore tempted to dwell in the concept of climate change, its theories, as well as literature of climate change. It also highlighted various impacts of climate change in various economic, social, political and environmental trends. Special concern was given to effects of climate change on schools, and how these negatively impact on teaching and learning. The paper therefore is paramountly advocating the integration of climate change education into the curriculae of educational institutions so as to serve as an eye opener, a panacea and medium of knowledge dispensation to teachers, students and the public. The paper went further to provide psychological implications on the negative impacts of climate change and therapeutic strategies to guide against these negative impacts. It discussed how schools are been affected and measures to be adopted and therefore provided recommendations to be adopted so that vulnerability of climate change and its consequences on economic, social, political and environmental sectors of life could be mitigated, particularly, the academic logjam being caused for long suffering teachers and students and the consequential educational impasse created by the phenomenal

Keyword: *Climate Change, Impacts, Global scale, Curriculum, Psychological implications.*

Introduction

Climate change has gained worldwide attention because of its impact or effect on the social, economic, educational, technological and environmental activities. Thus, seminars, workshops and other public discussions have been held and are still being held on how to combat any negative impacts on teaching and learning at all levels of education (Edo and Osuji, 2016). Climate change refers to a change in climate, attributable directly or indirectly to human activities that alter the atmospheric composition of the earth which lead to global warming. This change has the potential of affecting all natural and human systems and may be a threat to human development and survival; socially, politically and economically. Climate change has already been impacting on Nigeria as manifested by increased flooding, delayed rains, enhanced desertification, increasing bush fires and food insecurity. The government of Nigeria has made significant progress in addressing the problems of climate change through preparing, demonstrating, negotiating, collaborating and developing various policies, programmes and plans at national, regional and international levels. Despite all these, climate change is still on the increase, Although Nigeria is not a major contributor to global warming, it is really of great concern to the nation, since African countries have been identified as the most vulnerable. Combating climate change is a global effort and, as such, all countries must work together to reduce their Green house gases (GHG) emissions and learn how to cope with the impact. It requires mechanisms cutting across government sectors; it involves coordination among multiple sectors; and it requires technical support to strengthen institutional responsibility and additional research to address gaps in knowledge. Nigeria is one of the countries expected to be most affected by the impacts of climate change through rising sea level along her coastline, intensified desertification, erosion and flooding disasters and general land degradation, (Medugu, 2009), According to Medugu (2009) Nigeria will lose close to \$9 billion as a result of the catastrophe while, at least, 80 per cent of the inhabitants of the Niger Delta region of the country will be displaced due to the low level of the oil-rich region (below sea level). Nigeria is highly vulnerable to the impacts of climate change and the country's fragile economy makes the local ability to respond with difficulty. Nigeria has a variety of ecosystems, from mangroves and rainforests on the Atlantic coast in the south to the savannah in the north bordering the Sahara. Whether dry or wet, those

ecosystems are being found bare by global warming. While excessive flooding during the past decade has hurt farming in coastal communities, desertification is also ravaging the Sahel. Traditionally, desertification in the Sahel has been blamed on overgrazing practices of the local population. But it has been discovered that the real problem is climate change (Medugu, 2009). Rainfall in the Sahel has been declining steadily since the 1960s and this has resulted in the loss of farmlands and conflicts between farmers and herdsmen over ever decreasing land. Many different communities, including fishermen, farmers and herdsmen, are now confronted with difficulties arising from climatic changes. The livelihood of people are being harmed, and people who are already poor are becoming even more impoverished. Climate refugees are the result, as the changes make some land unlivable and affect water supplies. (Nasiru, 2012).

Some of the solutions proffered were the need to mainstream climate change into national, regional and state development plans, adapt policies needed to be an integral part of government initiatives, given the cross-cutting nature of the impact of climate change, as well as provide an important intersection between development and climate change adaptation and remediation in that they both aim to reduce the root causes of vulnerability. Others include raising awareness on issues of climate change which is presently at low ebb especially amongst vulnerable groups like women, children, even at the grassroots, especially rural dwellers, as well as revive the tree planting programme by raising awareness for individuals to plant trees. As part of the efforts to mainstream the climate change, the Federal government has proactively taken steps in addressing environmental problems. These include effective management of waste, flood and coastal erosion. It has also built up our advocacy programmes through workshops, seminars, public lectures, media campaign on, climate change and waste water summits, tree planting, land reclamation, landscaping and beautification, campaign against desertification through the desert warriors, and control of land, water, noise and air pollution. (Federal Ministry of Information and Culture (FMIC), 2016). Allied to this, the Great Green Wall of the Sahara and the Sahel Initiative is a planned project to plant a wall of trees across Africa at the southern edge of the Sahara desert as a means to prevent desertification. It is to be implemented in Nigeria in eleven frontline States of Adamawa, Bauchi, Gombe, Kebbi, Sokoto, Zamfara, Katsina, Kano, Jigawa, Yobe and Borno. It will cover 43 LGAs in the

frontline states to be covered to rehabilitate 225,000 Ha of lands. It involves establishment of green wall or shelterbelt from Kebbi State to Borno State, a distance of 1,500 km and 15 km wide, community sensitization and mobilization, promotion of alternative sources of energy, promotion of alternative means of livelihoods, promotion of dry land agricultural technology and promoting alternative water source for human, plant and animal use through solar powered boreholes, with over 300 functional boreholes in operation as at early September 2016. (Jumeke, 2016) Apart from the observations encapsulated in the communiqué, and steps taken by government so far, there is also the need to adopt appropriate technologies to mitigate the scourge at all levels, while there should be strengthening of the weak human capacity and infrastructure for mainstreaming climate change in national development. This paper is therefore meant to advocate inclusion of climate change in the curriculum of the junior and senior secondary schools and higher education minimum standard. The curriculae planners should ensure that they put in place core knowledge of, and information about, climate change as part of compulsory education for students at all levels. Students should learn about the potential impacts of unmanaged climate change, as well as options for adaptation and mitigation, in order to enable a complete and robust understanding.

Theories of Climate Change

Since the dawn of the industrial era, the atmospheric concentrations, several radioactively active gases have been increasing as a result of human activities. The radiative heating from this inadvertent experiment has driven the climate system out of equilibrium with the incoming solar energy. According to the green house theory of climate change, change the climate system will be restored to equilibrium by a warming of the surface troposphere system and a cooling of the stratosphere. The predicted changes, during the next few decades, could far exceed natural climate variations in historical times, hence the green house theory of climate change has reached the crucial stage of verification.

When policies and activities with one country generation cause deleterious consequences for those of other nations and later generations, they constitute serious injustices. Recognizing this, the international climate policy development process has expressly aimed to mitigate the pressing

contemporary environment threat in a manner that promote justice and avoid injustice as they attempt to deal with anthropogenic climate change. Atmospheric justice makes an important step towards providing us with a set of carefully elaborated first principles for achieving environmental justice. (Steve, 2008)

Social theories according to Elizabeth (2010), changed various courses and resources for some quite some years. This concerns the character of capitalism, the relation between nature and culture or the social process of problems definition. Social theory has much to offer but realizing that this much potential will require concerted effort and achieve engagement with new and familiar audiences. Issues at stake are that consumption is usefully understood as an outcome of practice people consume objects, resources and services not for their own sake but in the course of accomplishing social practices. (Ward, 2005). The other issue is that mitigating and adapting to climate change is sure to require different patterns both of consumption and daily life that fit within the envelop of sustainability and that are resilient, adaptable and fair. This depends on how people move around, what they eat, and how they spend their time. Social theory of practice provide an important intellectual resource for understanding and perhaps establishing social, institutional and infrastructural conditions in which much less resources and intensive ways of life might hold.

According to the World Wildlife Fund (2019), it revealed that the resources needed to maintain Western European habits currently exceed the earth's capacity by a factor of three. This has not been so. In the 1970s, on average, European levels of consumption remained within limit which our planet could sustain. How ordinary ways of life has become so resource intensive in such a short space of time is one of the puzzles that runs through the mind. To better things, we need to understand environmental impact of what they do, knowing the consequences of individuals diet, their mobility, the way they heat and height their home, and by adjusting resources, the way they should, use their car less, being vegetarian, considering population and ventilation, poverty reduction, income diversification, property management rights, and promoting collective security. (Elizabeth, 2010)

From the above discussed theories, this paper attests to the general theory and the social theory and therefore, requires the understanding of the concept of climate change, its causes, effects and how it's effects could be mitigated.

Based on this, this paper discussed the above areas and in addition to advocate for curriculum review in all educational institutions in Nigeria, thus, climate change should be integrated in to the curriculum so as to make citizens maintain sustainability in their lives.

METHODOLOGY

Research design

The adopted the qualitative research approach which provides for in-depth-study of 'things in their natural settings' (Denzin & Lincoln. 2000). Henning (2005) believes that in educational research, the qualitative approach is a useful means to obtain an in-depth understanding of an interactive and dynamic phenomenon, in this case, understanding the psychological implications of impact of climatic change on global scale, with focus on curriculum review on teaching and learning in educational institutions in Nigerian. Further reason for adopting qualitative research approach was due to its ability to focus on aspects of particular subject of enquire which are frequently overlooked when using quantitative research methods.

Impacts of Climate Change on Teaching and Learning

It has been discovered that the impact of climate change is noticed in change in temperature, rainfall and natural disasters caused by change of climate, contaminating coastal fresh water sources, and gradually submerging coastal facilities and barrier islands. Sea-level rise increases the risk of damage to homes and buildings from storm surges such as those that accompany hurricanes. United Nations Framework Convention on Climate Change in Vilnius (2006) defines it as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, Research shows that about one third of the nation's territory is under siege by the expanding frontiers of the Sahara Desert, with whole villages in the North disappearing under sand dunes turning the affected villagers into refugees(Nwankwo and Unachukwu, 2012). Educational institutions in Nigeria are also experiencing the harsh effects of climate change. Tertiary institutions are feeling the pangs of environmental disruptions that challenge their administrations, academic staff and effective functioning of these institutions, especially their teaching/learning situations. A case in point is the

flooding of parts of Usmanu Dan Fodio University in Sokoto and primary and secondary schools in 2010, which disrupted academic activities and rendered them comatose until succor came from the Federal Government and other well-meaning individuals in the country. (Borineka, 2016) The impact of climate change has equally affected curriculum in respect of advocating for the teaching and learning of a particular subjects or courses. Climate change is not offered now in the school as a separate issue or contents that affects other areas including the environment. Apart from the impact on the environment, there is tremendous impact on the technology which should put more pressure on the teaching and learning in the university system by laying emphasis on the instructional material that can adequately communicate to the students. However, it is noted by the UNICEF (2013) that climate change has made teaching and learning uneasy task because of the need to integrate its effects like disaster risks and environmental issues across the education system. Hence, policies and legislation, education sector plans and budgets, curriculae and examinations, teacher education, school infrastructure and facilities, learning environments, and school governance and management are imperative. The effects of climate change on academic staff role performance in the universities and other educational institutions can be felt in the disruption of teaching/learning activities, poor instructional delivery, irregular class attendance, difficulty in maintaining infrastructural materials and other facilities (Ajayi, 2010) Role performance signifies the procedures, ways or manner in which academic staff carry out their assigned institutional responsibilities or tasks. Whenever academic staff experiences the harsh effects of climate change such as erosion, flooding, increase rainfall, excessive heat windstorms, rainstorms, amongst others, their level of role or task accomplishment is drastically affected.

Effective climate change education therefore requires the construction of new knowledge and understanding within learners' existing, often well-established and deeply personal framework of existing beliefs, knowledge and understanding. In short, based on the impact. Some school of thoughts have advocated for teaching of climate in the educational institutions. (Nwanko and Unachukwu, 2012; Rose, Amadi and Nwachukwu, 2015 and Barineka, 2016). This is because of the observation that there is a disconnect between actual climate science knowledge and perceived knowledge (Dupigny-Giroux, 2008). Climate change is one of the greatest public policy issues in our time.

It has a lot of implications to humanity and the environment with its effects often linked to the collapse of various civilizations. Climate change is a change in the statistical distribution of weather elements and which is sustained for up to a decade or more (Nwankwo and Unachukwu, 2012). Climate change is a change in the statistical properties of the climate system when considered over periods of decades or longer, regardless of cause. For the United Nation (2010), in the Framework of Convention on Climate Change, climate change is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. Thus, the physical, environmental biological, cultural etc changes resulting from climate variations bring with them several challenges with significant negative impacts on human functioning. Thus, climate change affects teaching and learning hence resulted to poor academic results. A typical example is when there is intensity of down pour accompanied with thunder storm and whirlwind during the examination period. Thus, it can be deduced that the causes of climate change are multifaceted involving social, political and economic as well as environmental sectors. For Nwankwo Unachukwu(2020), climate manifested in two ways: natural(solar radiation mountain building, continental drift) and human activities (greenhouse gases e.g. methane emitted during production of gas and transport of natural gas, oil, coal, nitrous oxide emitted during the combustion of fossil fuels persistent deforestation, land use and animal agriculture). Climate has different and diverse effects on the teaching and learning in educational institutions. For instance, high intensity of heat resulted to discomfort for both the lecturers and students More so, during heavy rain fall with thunder storm often disrupt academic activities, technological concern, but that it is also hinges on education with particular references to teaching and learning. This implies the climatic condition has an adverse effect on the processes of academic activities. In another development, report from Barineka (2016) indicated that climate change effects resulting from excessive heat had a significant relationship with teaching and learning processes in any educational set-up. That is excessive heat influences academic staff role performance. This is so because when the weather is hot, excessive heat results which cause bodily discomfort, a state that cannot lead to improved role in teaching and learning processes

There are also cases of regular attendance of student and teachers because of erosion, flooding, increase in rainfall, windstorms, building collapsed buildings and bad roads. Nwakwo and Unehuckwu (2012) and Barineka(2016) reported that in 2010, the Haiti Earthquake killed 38,000 students and teachers and destroyed 80% of schools. In 2011, Great Eastern Japan Earthquake and Tsunami disaster cost about 235billion US dollars. In 2008, Sichuan earthquake, 10,000 students were crushed in their classrooms and more than 7,000 school rooms collapsed.

Against the above back drop, effective climate change education is required for teachers and students so as to make them adapt and mitigate the effects on teaching and learning. Thus, the purpose of this paper.

Climate Change and Curriculum Review

Curriculum reform becomes very paramount so as to integrate the concept of climate change in teaching and learning at all levels of education. In primary and secondary school education, this curricular reform would take place in the subject of Social Studies and Citizenship Education; in the tertiary institution, it would take its reforms in the Department of Geography and Environmental Studies. According to rose, Amadi and Nwachukwu (2015), currently, these areas fall short of instructing students on climate change and its impacts on the environment. Emphasis should be placed on the following areas in the curricula in various educational institutions at all levels:

- The meaning of the concept : Climate change and how it affects peoples' lives and property.
- Aims and purpose of studying climate change; weather, temperature, over population diseases etc.
- The effect of climate on local crops and the global economy;
- The definition of related concepts: greenhouse, gas emissions, climate system reservoir, sinks e.t.c.
- The challenges faced by farmers (fishermen, crop farmers, e.t.c) and their encounters and how they can avert them so as to increase their yields;
- The impact of climate change on transportation, industry, commerce, education, human settlements and housing, health and sanitation, forestry, free water resources, coastal water resources and fisheries;
- Climate change and disaster risk management in Nigeria;

- Individual respect for the environment;
- The production of carbon dioxide and carbon monoxide by human activities and the impact on the climate; deforestation, droughts, low rain or heavy rain, flood
- Ways to reduce emissions (mitigation) and respond to and manage the impacts of climate (adaptation), gas flaring in the oil producing areas.
- The basic science of climate change;
- Climatic impact, sustainability and energy use and;
- The potential impact of unmanaged climate change.
- Mitigation or Adaptation Strategies such as: the use of wind, hydro and solar sources of energy burying wastes, encouraging green economy and afforestation, bioengineering of microbes to eliminate Green House Gas, tilling the sky with sulphur iv oxide to block intense solar rays, stipulating laws and policies on climate management

Currently, the Nigerian curriculum does not sufficiently expose students to the dangers of climate change. One recommendation is that climate change should be taught as a separate subject and, if possible made one of the compulsory courses offered in the school certificate examination for Nigerian students. Such study will allow students to actively disseminate knowledge and information related to climate change. Teacher training and the provision of adequate equipments should be provided to give students the essential knowledge, skills and understanding that they need to be educated citizens. The teaching of climate change should be integrated in to science, geography, and social studies.

Integration of Climate Change Into The Curriculum Of Educational Institution In Nigeria.

Materials Required For Delivering the Content of Climate Change in Educational Institutions

Anemometer for measuring wind speed. barometer for measuring pressure; computer software for analyzing data; thermometer for measuring temperature; rain gauge for measuring rainfall; wind vane, for wind direction; flow-meter for measuring gas flaring; demonstration farm etc.

Measure the impact of climate change and containers for the institutional materials.

Psychological implications of Climate Change

It has been empirically discovered that the extreme weather multiyear warming and tropical cyclone expose each associate worsened mental health. The result dream from nearly 2million randomly sampled United States Presidents between 2002 and 2012,(Nick, Robyn, Martin and Iyad 2018). According to Allen, Balfour, Bell and Marmot (2014) social economics and physical systems are critical determinants of psychological wellbeing . By disrupting these systems, climate change is likely to exacerbate known risk factors for mental disorders. People will experience mental illness in their life time with anxiety, stress related, and mood disorders, comprising the majority of diagnoses and will also diminish productivity (Berry, Waite, Dear, Capon and Murray (2018) and reduce quality of life (Allen, Balfour, bell and Marmot, 2014) Even subclinical levels of distress can impair psychological and immunological (Glaser, Kiecolt-Glaser, 2005) functioning, reducing the ability to cope with adversity.

Warming is likely to amplify the frequency and intensity of natural disasters, which often causes physical injury, psychological trauma, infrastructural damage, and societal disruption in affected regions. Rising temperatures amplify risks to human physical health, harm economics activity, spur social conflict, and produce forced migration and ecological losses. Exposure to hurricanes and floods is associated with symptoms of acute depression as well as post traumatic stress disorder. Both heat and drought amplify the risk of suicide and psychiatric hospital visits increase, during hotter temperature. Those with preexisting mental health conditions and lower socioeconomic status are among the most vulnerable to these adverse environmental conditions (Nike, Robyn, Migliorini, Martins, Lyad 2018).

The World Health Organization (W H O) estimate an increase of two hundred and fifty thousand excess deaths per year between 2030 and 2050, due to impact of climate change. Impact according to WHO (2015) including heat related morbidity and mortality increases vector –burn diseases like dengue malaria increases respiratory illness, and morbidity and mortality due to exactly whether events

Psychological Solutions

According to Katie, Blashki and Reifels (2018), psychological adaptation should be embarked upon. That is, active hope is required to move hopeful intention from a passive state should be replaced with an active process of climate change mitigation and adaptation behaviours, policies, practices, behavioural interventions, specific training and pharmacotherapeutics, should be put in place. Others are primary health care intervention, individual and group-based therapy, cognitive-based therapy as a continuity based intervention, cognitive restructuring, and stress inoculation training as well as crises counseling. More broadly, emotional resiliency maybe sustained by engaging with art, literature, and spirituality.

In order to support reasonable population, the list below contain priority adaptation, mechanism that ought to be considered to support population-levels health in a changing climate:

- Policy responses: Improving access and funding to mental health care.
- Surveillance and Monitoring: Administering epidemiological survey after extreme weather events, and monitoring emergency department visits during heat waves and following extreme weather events.
- Practice: The application of a stepped-care approach to mental health that is often used in disaster mental health to support different levels of interventions depending on the timing of the disaster and the level of distress.
- Preparation and response: Climate change adaptation and resilience planning in the mental health system.
- Community-based interventions: Climate change resilience plans that address psychological wellbeing,
- Special training for care providers and first responders: Psychological first aid.
- Environmental preservation: This provide people with a sense of stewardship and personal investment that can help people over come feelings of hopelessness, anxiety, and ecoparalysis. Forest bathing can result in decrease of cortisol levels, plus rates, and negative feelings and significantly increased positive feelings, quality of life, a sense of place and belonging, self-identity, restoration and inspiration, (WHO; 2015, WHO, 2017 and United Nations, 2017).

- Logotherapy: - Victor Frankl is the founder of logotherapy in 1940s in Vienna (Austria). He believed that humans are motivated by “will to meaning” that humans should find the meaning to life even in the most miserable of circumstances (weather flood, fire, attack and other disasters). He believed that Human being is an entity that consists of body (Soma), mind (psyche), and spirit (Noos) and that we have body and mind but the spirit is what we are, or our essence. Therefore, logotherapists, psychologists, and counsellors should adopt strategies to assist victims who are feeling the impacts of climate change. These are:
 - (a) Dereflection – helping victim or patient to focus a way for themselves and towards other people to become ‘whole’ and to survive circumstances
 - (b) Paradoxical intention: - techniques that make the person wish what others are wishing him based on his situation ‘let it be’ in cases of ridicule, anxiety or phobias but with the spirit of overcoming such situation.
 - (c) Socratic dialogue: helping to discuss with victims, client or patient, so as that he or she can attain self discovery or solution to his or her problems. These strategies are the same with newer forms of treatment such as Cognitive-Behavioural Therapy (CBT) and Acceptance and Commitment Therapy (ACT)

Conclusion

This paper dwelt in the concept and theories of climate change and how climate change has negatively impacted on the economic, social, political, ecological and environmental spheres of life. It also discussed how climate change effects could be mitigated. The paper suggested curriculum review and integration of climate change into educational institution curriculum at all levels, and provided various concept on causes, effects and mitigation measures so as to make students and learners adapt to new measures for sustainability.

Recommendations

Based on the title of this paper, the following recommendations are presented:

- To formulate policies by linking with public agencies, private sectors and civil society so as to build a strong climate change mitigation and adaptation measures for sustainability.

- To sensitize the public on the effects of climate change so as to adapt to new strategies as provided by professionals and the government
- To integrate climate change into the educational curriculae by curriculumists in all educational institutions in Nigeria and researchers should be more involved in finding various solutions to climate change.
- Psychologists, logotherapists, counselors, health workers and social workers should be involved in the sensitization process through the media and community-based counselling as well as adaptation strategies for the masses so as to mitigate the negative effects of climate change in Nigeria.
- People leaving in vulnerable areas of attack as a result of climate change like flood prone areas, deserts, schools in riverine areas should either relocate to safe areas or find protective or defensive means against any foreseeable or unforceable disaster as it is said, "To be warned, is to be forearmed".

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