

Climate Change and the Need for New Teacher Education Curriculum in South-East, Nigeria for Sustainable Development

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Abstract

The ravages of climate change have become topical global issue that has threatened the sustenance of man and environment. Though a global phenomenon, its deleterious effects such as excessive flooding which breeds more mosquitoes and heightens malaria attacks, are evident in Nigeria, a developing country. It does seem that the realities and phenomenon of climate change are not covered in the curriculum of teacher preparation programmes at all levels including primary science health programmes in primary schools. It is therefore pertinent that Nigeria should be part of the global race to combat climate change if her citizens must live in sustainable safe environment. The necessary first step is to review the curriculum of teacher education programmes to introduce climate change since teacher education and their products at all levels, constitute the largest proportion of those who continually interact with the citizenry. This may help to create the needed awareness about climate change.

This study therefore, investigated the level of awareness of climate change effects amongst teacher educators and their students in teacher education institutions in South-east, Nigeria and the extent of integration of climate change concepts and issues in the programmes of relevant disciplines. The population comprised of all teacher educators and students in all the teacher education institutions in South-east, Nigeria. The design is a survey. A multi-stage cluster random sampling technique was employed to select three out of five states in South-east, Nigeria, four colleges/institutes/faculties of teacher education from each state and five departments from each college/institute/ faculty totaling 60 departments. Simple random sampling was adopted in selecting 15 final year student teachers and 10 educators from each department, giving a sample size of 900 students and 600 teacher educators. Two research questions and one hypothesis guided the study. Instruments for the study included a questionnaire and observation checklist. Mean ratings were used in answering the research questions and percentages in analyzing the checklist. The hypothesis was tested, using z-test at 0.05 level of significance. Result showed low level of awareness of climate change amongst the respondents. The checklist revealed a non-integration of climate change issues in the teacher education curriculum as a way of equipping the products of the programmes to face the challenges of climate change for sustainability.

Introduction

Nigeria is a country in West Africa with 36 states. It shares borders with the Republic of Benin in the west, Chad and Cameroon in the east, and Niger in the North with Lake Chad to the north east. Nigeria is located in the tropics where the climate is seasonally damp and very humid. The Southern part of Nigeria experiences heavy rains with an annual rainfall of above 2000mm (78.7inches) annually. The Sahel climate is predominant in the northern part of Nigeria with a relatively lower annual rainfall compared to the southern and central parts of the country. The rainy season in the north lasts between three to four months leaving the rest of the year hot and dry.



Fig 1: Map of Nigeria showing its 36 states Source: www.global-greenhousewarming.com

Global climate change is one of the most complex and formidable challenges facing our society today. Developing countries such as Nigeria are likely to be affected by climate change much more than developed countries that have with good information systems, sound economies and technological capacity. Current evidence shows that important pivots of the economic and social developments are already adversely affected by the ravages of climate change to the extent that sustainability are being threatened and or jeopardized.

The international community has begun to make concerted efforts in addressing the issue of climate change through the United Nations Framework Convention on Climate Change (UNFCC) and its Kyoto Protocol. The Kyoto Protocol is a multi-lateral treaty made under the United Nations Framework Convention on Climate Change (UNFCC). The IPCC – The Intergovernmental Panel on Climate Change is the most prominent of the global bodies that are calling immediate and dramatic cuts in carbon emission. The UNFCC on its part committed the signatory governments to a voluntary non-binding effort to reduce Green House Gases (GHG) in the atmosphere with the goal of preventing dangerous anthropogenic interference with earth's climate system.

Much as a lot of efforts have been made towards effectively mitigating and adapting to the impact of global climate change, they have not actually produced the desired results. The global sensitization regarding awareness and clear understanding of the imminent dangers posed by climate change is not properly articulated yet. Furthermore, some still remain doubtful regarding the reality of climate change, its human-induced source, or the need for change. There is need for properly educating people about this complex phenomenon. Proper understanding of the ravages of climate change may induce attitudinal and behavioural changes on individuals and groups which may produce sustainable behaviour eventually. The way to achieve this is through education and the employment of well-articulated curriculum.

Curriculum is the vehicle through which learning opportunities are offered to the learners. Its dynamism is such that emergent problems and issues, considered significant and important to the learners, could be easily integrated into the course contents offered in schools. This makes a case for a new curriculum for teacher education programme in Nigeria which would accommodate climate change issues. This is the thesis of this study.

Understanding Weather, Climate and Climate Change

Weather is the actual state of the atmosphere in a given location at a given time with reference to sunshine, rain, wind etc. Climate, on the other hand, is the average weather condition of an area over a period of 30 years. Wikipedia (2009) defines climate as “encompassing the statistics of temperature, humidity, atmospheric pressure, wind, rainfall atmospheric particle count and numerous other meteorological elements in a given region over a period of time”. Gesh (2011) explains that climate is the meteorological conditions including, temperature, precipitation and winds that characteristically prevail in a particular region.

The UNESCO International seminar on climate change education defines climate change “as a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years”. IPCC (2007) defines climate change as “any change in climate overtime, whether due to natural variability or as a result of human activity “The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change 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 observed over comparable time periods”.

Causes of Climate Change

Global warming (also called the green house effect) describes the gradual increase of the air temperature in the earth's lower atmosphere. It is caused by the build-up of greenhouse gases in the atmosphere such as carbon dioxide and methane which form a sort of blanket over the earth, trapping in heat that would normally escape the atmosphere. IPCC (2010) posits that human activity is changing the amount of greenhouse gases in the atmosphere in three important ways namely: burning fossil fuels (coal, petroleum, gas and oil), deforestation and a growing population. In Onwuzurike's (2010) views, fossil fuels are burnt to create energy which is used for many things including heating homes and building; growing, transportation and cooking food, travelling (e.g. by car, plane, bus and train), manufacturing, using and transporting products, treating water to make it drinkable, heating it and piping it into homes. Deforestation makes such a huge contribution to carbon emissions because trees absorb carbon dioxide as they grow. The more trees that are cut down, the fewer there will be left to absorb carbon dioxide, leading to it building up in the atmosphere. Furthermore, the agriculture (bush-burning) and industry that replace the forest often cause an extra problem by producing carbon emissions on their own. Thus, human activities have added extra carbon to the atmosphere putting the carbon cycle out of balance.

Effects

Climate is no longer thought as a threat to our future, developing countries as Nigeria, are already experiencing its effect in form of;

- Rising global temperature which may in turn cause glacier retreat, arctic shrinkage and world sea level rise.
- Changes in the amount and pattern of precipitation may also result in increased flooding and associated loss of life, properties and productivity.
- Increased droughts leading to losses of crops, livestock, fisheries and wildlife and decreased river flows, water quality and human health.
- Reduced crop yields leading to hunger and malnutrition.
- Increased deaths due to heat and cold waves, floods, storms and fires.
- Increased cardio respiratory diseases and changes in the distribution of certain disease vectors, including malaria.
- Increased desertification, expanding arid lands and other similar changes.
- Ocean acidification and coral reef bleaching.
- Increased salinization of fresh water source.
- Animal and plant migration and massive extinctions.



Fig. 2: Flooded Community in Southern Nigeria



Fig. 3: Desertification in Northern Nigerian Community

Anyadike (2009) opines that Africa (vis-à-vis Nigeria) is susceptible to climate change effects due to the desertification process, declining run-off from water catchments, declining soil fertility,

dependence on subsistence agriculture, the prevalence of AIDS and vector-borne diseases, inadequate government mechanisms and rapid population growth. It is pertinent to note that climate change has consequences not only for the school curriculum (i.e. classroom engagements), but also for the school system (especially the school plant) for example:

- Places that are ravaged by tornados or wind must now put up more resistant school buildings and/ or build in relatively tornado-free zones.
- Places that have become flood planes must now bear this in mind in constructing school buildings, or move away (say up-hill) to remain safe.
- Places that have become hotter than normal must adjust through:
- Better ventilation, fans, air conditioners etc.
- Adjust the daily school contact hours such as avoiding the hottest hours.

McMichael (2014) affirms that climate change does more than alter weather patterns, it also increases the incidence of diseases transmitted through water and via vectors like mosquitoes. In all these, awareness is low in developing countries. Olorunfemi (2010) puts it that the biggest obstacle is perhaps, lack of awareness and knowledge, lack of information (awareness) and knowledge (education) about climate also means that many Nigerians, are reluctant to accept the reality of climate change which can change lives drastically. The UNDP (2009) report stresses that the level of awareness is rather low in Nigeria and it is likely to continue if no intervening measures are taken.

In a survey by Ishaya and Abaje (2008) of indigenous people's perception on climate change and adaptation strategies in Jema, a local government in Kaduna State, 13% of the respondents agreed that there is a high level of awareness on climate change in the study area; 33% said they don't know and finally, majority 54% of the respondents declined, saying that the awareness of climate change is very weak in the study area and Nigeria as a whole.

Ozor (2009) opines that there is need for young people (students) to gain knowledge and understanding about climate change. Such knowledge and understanding about climate change will enable them to respond effectively on graduation, to the global challenges posed by climate change. In doing this, the curriculum of "teachers of teachers" (teacher educators) in particular, and educational institutions in general, has to be modified (new curricula) to accommodate the current issues of climate change.

Awareness of climate change is growing and the public pressure to do something about it is building. Onwuzuruike further noted that the Inter-government Panel on Climate Change (IPCC) shared the 2007 Nobel Prize for efforts to disseminate greater knowledge about man-made climate change

However, public understanding of the cause and consequences of climate change still appears to be low, as well as awareness of the methods that mitigate its effects, particularly in developing countries. The sustainability of man and environment is thus threatened.

Concept of Sustainability

This is a concept that has emanated from environmental studies. It has to do with man's exploration and understanding of the environment, the dynamics of the environment and how man makes use of the environment without jeopardizing the chance of the future/next generation. Sustainable development seeks to meet the needs and aspirations of the present generation without compromising the ability to meet the needs of the future generation. Segynola (2005) remarks that it also entails the alleviation of poverty, and the maintenance of environmental ecological equilibrium in the process of exploiting resources for the provision of jobs, income, food and social services that promote the quality of human dignity for the present and future generations.

A balance of the three components of economic, environmental and social factors would enhance the attainment of sustainability.

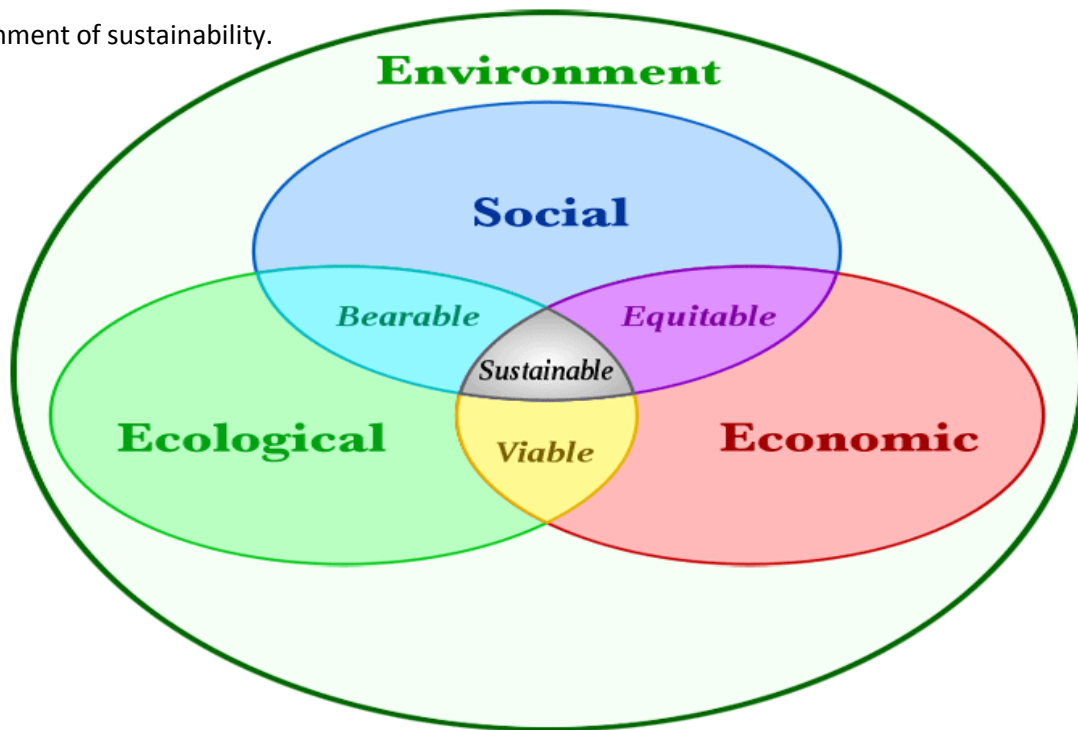


Fig 4: Diagrammatic illustration of the concept of sustainability Source: www.copelandborough.com

Nwana (1990) provides another dimension to the idea of sustainable development when he defined it as a development scenario that persist from local/ domestic resources after external aid has either been withdrawn or ceased to exist. This dimension to development refers mainly to the common

phenomenon in many developing countries in which development efforts collapse as soon as foreign aid is withdrawn or lapses, and the people return to the status quo centre. Surprisingly, there is little understanding of the true meaning and effects of climate change, global warming and sustainable development. Conceivably, curriculum is thought of as the engine that provides the learning experiences and opportunities engendered for sensitizing people, raising their awareness and understanding about climate change issues.

The Concept of Curriculum

The early proponents of curriculum viewed it as “a course of study” or the ground which students have to cover. In time, curriculum came to be viewed as “the cumulative tradition of organized knowledge (the traditionalist’s conception); and also as “planned and guided experiences” (progressives’ conception). Tanner and Tanner (1975) give what has been described as a comprehensive definition of curriculum, the planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experiences, under the auspices of the school for the learner’s continuous and willful growth in personal-social competence.

This definition has brought to limelight the dynamic nature of knowledge and the fact that curriculum undergoes several radical changes to address emergent issues and problems. The discovery of new knowledge or the emergence of new issues and problems demands that knowledge be reconstructed and curriculum reviewed, reformed, or renewed to accommodate new knowledge and/or solve new problems and issues. Climate change is one of such new problems. There is therefore, great need to renew the old curriculum of teacher education programmes.

Concept of Teacher Education and Teacher Education Curriculum

Teacher education is an institutionalized procedure aimed at purposeful preparation of teachers or all those who are engaged in educational activity as their career. Good¹⁶ sees it as a programme of activities and experiences developed by an institution responsible for the preparation and growth of persons preparing themselves for educational work or engaging in the work of the educational profession. As stated by the Federal Republic of Nigeria (2004), such programmes are offered in educational institutions such as Colleges of Education, Institutes and Faculties of Education in Universities, National Teachers Institute (NTI) and Teacher Centres.

Teacher education curriculum, according to Mbakwem (2000) is the programme of study geared towards the preparation of teachers for the various levels of educational ladder. Simply put, for a

particular group of learners – primary, secondary, tertiary etc., there is a corresponding level of teachers. The curriculum of teacher education may rightly be described as the totality of experiences, activities and trainings which are systematically planned and tailored towards a professional training of all those who are engaged in the preparation and development of the young and immature persons of the society. Offorma (2002) remarked that it includes teachers, subject content, method of teaching and evaluation as well as the physical and psychological dimensions of the experience.

By this arrangement, both pre-service and in-service teachers are equipped with the needed competencies, skills, knowledge and insights required for adequate man power production and efficient and effective functioning in the society. The philosophy on which teacher education in Nigeria is based is articulated by the Federal Republic of Nigeria which includes:

- To produce highly conscientious and efficient classroom teachers at all levels of our educational system;
- To encourage further the spirit of enquiry and creativity in teachers;
- To provide teachers with the intellectual and professional background adequate for their assignment and to make them adaptable to any changing situation not only in the life of their country, but in the wilder world.

A review of curriculum of Teacher Education Institutions reveals that the curricula do not provide the expected knowledge, skills and competencies to students on climate change issues. These gaps must be filled by developing a curriculum on climate change for teacher education.

In order to meet the demands of the intellectualism and professionalism and encourage the spirit of enquiry and creativity that would make them adaptable to any changing situation in the life of their country vis-à-vis wilder world, the curriculum of teacher education needs to be reformed and or renewed to accommodate new vital trends, new issues, new knowledge, skills, new approaches, new methodologies and new strategies for dealing with new problems. Climate change and Global warming are among such emergent issues, very challenging ones, that require new insights, methods, approaches, pedagogies, new knowledge and new curricula needed for building necessary capacities for tackling them.

There is ardent need to infuse climate change issues into the curricula of schools in general, and teacher education programmes in particular. Educating those currently at school on climate change, (more so, those who ultimately will inculcate knowledge to the generality of the populace), will help to shape and sustain future policy making. Furthermore, it will ensure that learners gain knowledge and

understanding about climate change and when learners are thus exposed, they would avoid acts capable of threatening the ozone layer or jeopardizing chances of human existence. It is also important that lecturers and their students be made aware of the various international conventions on climate change such as United Nations Framework Convention on Climate Change and the Kyoto Protocol and a range of other informal partnerships and dialogues that provide a framework that support cooperation and a foundation from which to build further collective action. It is also important to tap indigenous knowledge about climate change.

Climate change is not restricted to any discipline. Ivowi (1998) opines that Curriculum could be restructured using selected themes (thematic approach) upon which integrated subject approach will be used. Teachers' programme on climate change focuses on interdisciplinary approach to assure effective collaboration of academic professions where experts in various fields will contribute their quota, thereby enriching course content. Such an education programme is designed to inform the people about climate change dynamics, the causes and consequences of human activities and the interrelation of environment change to development and to aspects of living and survival and quality human beings. These make for sustainable development.

Teacher education curriculum content can be integrated (infused) into the existing relevant disciplines such as Geography, Agricultural Science, Social Studies, Integrated Science, Environmental Studies, Economics, to mention but a few to avert curriculum overload. Thus, content areas should include:

- Introduction to climate change.
- Causes of climate change (global warming, natural phenomenon, man-made or anthropogenic).
- Impacts of climate change on human lives, economy and social life.
- Human security and climate change – national and international.
- Effects of climate change:
 - Sea level rise inundating large areas of low-lying countries.
 - Increased diseases – Outbreak of cholera, malaria, encephalitis and tse-tse fly known as global killers causing misery and conflict.
 - Loss of flora and fauna due to distorted ecosystem.
 - Dried sea beds increasing salinity and endangering aquifers, threatening water security.
- Adaptation and mitigation strategies – indigenous and modern innovations for adaptation.
- Local and global issues on climate change.
- Global policy issues.

New teacher education curriculum on climate change for sustainable development endorses a learning sequence and strategy that will not only make climate change a study but also a way of life which improves quality of life of each individual or group that goes through the course, as well as the life of those they influence through interaction. The question is why we have to mainstream climate change issues into the curriculum of teacher education.

Strategic Objectives

To ascertain the level of awareness and understanding of climate change effects amongst teacher educators and students in teacher education institutions in South-east, Nigeria.

To determine the extent of integration of climate change concepts and issues into the curriculum of teacher education institutions in South-east, Nigeria.

Research Questions

The following research questions guided the study:

- What is the level of awareness of climate change effects amongst teacher educators (lecturers) and their students?
- What is the level of integration of climate change concepts and issues into the curriculum of teacher education?

Hypothesis

There is no significant difference in the mean score responses between teacher educators and students regarding their level of awareness of climate change effects.

Methodology

The research is a survey. The population of this study consisted of the entire lecturers and students in all teacher education institutions in the South-east, Nigeria, made up of Abia, Anambra, Ebonyi, Enugu and Imo State. A multi-stage cluster random sampling was used to select three states out of five, 4 Colleges/Institutes/Faculties of Teacher Education from each State and 5 departments from each College/Institute and Faculty, totaling 60 departments. Simple random sampling was employed in selecting 15 final-year students and 10 teacher educators from each department, giving a sample size of 900 students and 600 teacher educators. Two research questions and one hypothesis guided this study.

Instruments needed for this study included 12-item questionnaire derived from the review of literature. It has two sections. Section A touched on bio data information of the respondents, relating to institution, discipline, status etc. Section B addressed the research question one. It was a rating scale in

which lecturers and students were asked to rate some items regarding climate change effects based on their perceptions. The rating section was based on a four-point rating scale of vividly aware, aware, moderately aware and minimally aware weighed 4,3,2,1. The criterion mean was 2.50 (awareness level). An observation checklist (10-item check) was used in identifying the extent to which the climate change effects were integrated (infused) into the curriculum of various departments/disciplines of teacher education programmes.

Content validity of the items was established by three experts in environmental management studies and two in measurement and evaluation from two universities in the South-east, Nigeria. They made useful suggestions and corrections which were reflected in the final draft of the questionnaire. To determine the reliability, the test was administered on 10 teacher educators (lecturers) and 10 student-teachers respectively using split-half method. Cronbach Alpha test showed a co-efficient alpha value of 0.81 and 0.79 respectively obtained for the internal consistency of the test. The instrument was therefore considered adequate and appropriate and could be used. Five well trained research assistants helped the researcher to administer the instrument on the respondents. The researcher handled the observation checklist by recording in percentages the aspects of climate change that were integrated into the curricula (lesson delivery, lecture notes, students' text materials etc. were scrutinized). Mean and standard deviation were used in answering research question one while percentages were used in analysing the checklist. The z-test was used in testing the only hypothesis at 0.05 level of significance such that any z-test value less than 1.96 ($p < 0.05$) was regarded as "insignificant" while any calculated t-test value above 1.96 at ($P > 0.05$) was regarded as "significant".

Table 1	
Research question 1	
Item Mean Score Range	
Mean Score Range	Decision Level
38.5 – 47.5	Vividly Aware
29.5 – 38.5	Aware
20.5 – 29.5	Moderately Aware
11.5 – 20.5	Minimally Aware

Results

Research Question 1: What is the level of awareness of climate change effects amongst teacher educators and student teachers in South-east, Nigeria?

Table 2: Mean Responses as to the Level of Awareness of Climate Change effects.

S/N	Items	Lecturers N = 600		Students N = 900	
		\bar{X}	SD	\bar{X}	SD
1.	Increases the volume of flooding and erosion which destroy human life and property	2.69	0.86	1.25	1.07
2.	Causes exponential global increases in temperature that have major consequences on animals, plants and weather patterns.	1.99	0.70	2.12	1.11
3.	Causes rise in sea level	2.06	0.71	1.25	1.07
4.	Increases drought, causing loss of livestock, crops and fisheries.	2.10	0.83	2.28	1.05
5.	Increases death, diseases and infections such as malaria, cholera and diarrhea.	2.06	0.73	2.12	1.11
6.	Increases frequency of cardio –respiratory diseases (e.g. Asthma)	2.03	0.73	1.25	1.07
7.	Worsens access to safe water and enhances poisonous water supplies	2.18	0.78	2.25	1.07
8.	Enhances potential dangers in declining agricultural productivity.	1.94	0.68	2.12	1.11
9.	Causes coastal fresh aquifers to suffer salinization, increasing water stress and exacerbating water related problems (IPCC, 2007)	1.97	0.74	2.25	1.05
10.	Increases desertification leading to loss of agricultural land and destruction of economic infrastructures	2.36	0.65	1.25	1.11
11.	Causes over 150,000 people to die every year from health-related effects of climate change (WHO, 2001)	2.14	0.76	1.12	1.11
12.	Responsible for 3.3 million death globally in form of malaria, diarrhea diseases and malnutrition (WHO, 2005)	2.03	0.76	2.59	0.97
	Total Item Mean	25.55	8.96	21.88	12.86

A look at the item mean score range in table I reveals that lecturers total item mean score of 25.55 as well as students total item mean score of 21.88 fall within the moderately aware decision level.

Research Question 2: To what extent are climate change concepts and issues integrated into the curricula of teacher education programmes in South-east, Nigeria?

Table 3: Climate Change Concepts and Issues Integrated into Teacher Education Curriculum.

N = 60 Departments

S/N	Climate Change Concepts and Issues	Level of Integration
1.	Meaning and Definition of climate change	10(16.67%)
2.	Causes of climate change	15 (25%)
3.	Global warming and consequences	Not integrated
4.	Effects of climate change	5(8.33%)
5.	Expected impact of climate change on economy, social and cultural life.	8 (13.33%)
6.	Global and local issues on climate change	5 (8 1/3%)
7.	Adaptation and mitigation strategies	Not integrated
8.	Indigenous and modern innovations for adaptation	Not integrated
9.	Global policy issues on climate(UNFCC; Kyoto protocol; NAPA etc)	Not integrated
10.	The politics and policies of climate change	Not integrated

The researcher accepts a baseline of 50% integration level of the number of departments and above, that is 30 and above out of the 60 departments as having high level of integration of climate change concepts and issues in the curriculum of teacher education. Table 3 shows that the highest number of departments that integrated climate change concepts and issues is 15, which is just one quarter of 60 departments. Many departments did not integrate at all.

Hypothesis 1 (Ho₁): There is no significant difference between the mean responses of lecturers and students with regards to their level of awareness of climate change effects.

Table 4: Z-test Analysis of Response Differences of Lecturers and Students regarding their level of awareness of Climate Change Effects

Status	n	\bar{X}	SD	z-Crit	z-Cal	Decision
Lecturer	600	25.55	8.96	1.96	7.09	Reject Ho
Students	900	21.88	12.86			

Critical t = 1.96; n = 1,500 p<0.05.

Data on table 4 reveals that z-calculated (7.09) exceeds the critical value (1.96) at 0.05 level of significance. Thus, lecturers level of awareness of climate change effects differ significantly from that of the students. The null hypothesis is thus jettisoned and it is replaced by the alternate hypothesis.

Discussion of Results

The item analysis of the responses of the lecturer and students regarding their level of awareness of climate change effects is shown in table I. The total item mean of the lecturers (25.55) and the students (21.88) fall within the moderately aware decision level respectively. By implication, their awareness level is low. This finding corroborates with the affirmation by Olorunfemi and the UNDP report which stressed that the level of awareness of climate change is rather low in Nigeria. In addition, the findings made by Ishaya and Abaje show that 54% of their respondents were of the opinion that the awareness of the climate change is very weak in the study are (Kaduna state) and Nigeria as a whole.

The results of the analysis of data on table 3 did not leave anyone in doubt as to the near absence of integration of climate change concepts and issues in the teacher education curricula in South-east, Nigeria. Data revealed that only 15 departments out of 60 integrated few aspects of climate change concepts and issues such as meaning of climate change, causes of climate change and expected impact of climate change on economy, social and cultural life. Issues such as adaptation and mitigation strategies, indigenous and modern innovations for adaptation, global policy issues on climate change (UNFCC, Kyoto Protocol) and the politics and policies of climate change were not integrated at all, meaning that the student teachers will graduate without knowledge and understanding of these concepts and issues. Ozor was right when he emphasized that curriculum of “teacher of teachers” in particular and educational institutions in general, has to be modified (new curricula) to accommodate the current issues of climate change.

Curriculum planners in Nigeria appear not to have come to terms with the criterion of dynamism characterizing curriculum planning. Curriculum planning is a dynamic process, therefore emergent global critical and topical issues as climate change ought to have been taken care of. Since over a decade, climate change phenomenon has been pervasive as well as threatening and it is expected that curriculum planners ought to have properly articulated and integrated it into the curricula of teacher education programmes in particular and all other levels of education also. It is not so yet in Nigeria. This has serious policy implication.

Admittedly, both teacher educators (Lecturers) and the student teachers' awareness level of climate change effects are low in Nigeria, but the result of the analysis of data in table 4 revealed a significant difference between their level of awareness and the tilt is to the favour of the lecturers whose total item mean score is 25.55 against 21.88 of the students. This is not satisfactory though. Lecturers should be abreast with new knowledge, current issues and research findings and up-date themselves adequately. It is stating the obvious that they cannot give what they do not have.

Conclusion

In Nigeria the phenomenon of climate change effects has not been thoroughly grasped. Though a global issue, Nigeria is hardest hit with large number of her populace becoming flood refugees added to her already high population, high vulnerability, low adaptive capacity due to poverty and high illiteracy level, high malnutrition and security risk. The agricultural sector, the mainstay of Nigeria's economy is adversely affected with unprecedented heavy rains in some areas and complete drought and desertification in other areas (the northern part). Malaria disease is on the increase caused by excessive flood and the death toll is high each day despite government efforts at combating it (treated mosquito nets issued free to citizens, drainage construction etc).

Much still needs to be done in putting up more resistant school buildings or constructing school buildings up-hill (away from flood planes) to remain safe, adjusting the daily school contact hours such as avoiding the hottest hours or flood periods as the case may be. For encouraging and maintaining sustainability there is need for creating more awareness about the ravages of climate change and educating the citizens regarding strategies to cope with, adapt to or mitigate climate change effect. In this regard, there is need for Nigeria to part of the global race to combat climate change for her citizens to live in and enjoy sustainable safe environment.

Recommendation

- Curriculum of educational institutions should be revised to accommodate the current climate change issues.
- Government should demonstrate the political will by sponsoring teachers to seminars and workshops to learn the methodology, new approaches and resources for teaching and learning about climate change.
- Enlightenment campaigns and capacity building for the non-school going citizens should be put in place to keep them abreast of current happenings. The mass media campaigns should be strong enough to spark commitment and action among governments, non-governmental organizations (NGOs) donor agencies and civil society (especially amid the communities) for sustainable adaptation strategies to socio-economic and health challenges with climate change.

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