

EXTENT OF NIGERIAN TEACHERS UTILIZATION OF CLIMATE CHANGE ADAPTATION PRACTICE CHARTS AS CURRICULUM LEARNING MATERIALS FOR EFFECTIVE INSTRUCTION

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Abstract

In undertaking the study to determine the extent of teachers' utilization of climate change adaptation practices chart for effective instruction, 2063 secondary school teachers in Owerri Education Zone were surveyed. One research question and one Null hypothesis guided the study while the data collected was analyzed using mean ratings and t-test statistical techniques. The findings indicated that flow chart, strip and flip chart tabulation chart, time and sequence chart, except relationship chart for demonstrating climate change adaptation practices namely; mobility, storage, diversification, communal pooling and market exchange were not adequately utilized by secondary school integrated science and social studies teachers. It was then recommended among other ideas that teachers should be sufficiently exposed to opportunities which will make them to use .climate change adaptation practices chart as a curriculum learning material for effective instruction.

Key words: Teachers, utilization, climate change, adaptation practice, curriculum learning material.

INTRODUCTION

The principles and practices of effective teaching and learning recommended arranging, planning, preparing and using of material resources in effecting instruction which involves either sight, sound or both for the purposes of attaining educational objectives. Among the materials in recent times which are always advocated for are charts which includes diagrams, graphics, lists, maps and tables which are designed in such a way as to make information easy to understand. Charts provide data about weather, climate changes, business variations and geography. They serve as aids in effecting instruction in any classroom in the schools.

When film and sound technologies developed as from 1920 or thereabout visual instruction movement emerged. The movement encouraged the use of visual materials to make some ideas and especially those

ideas which are abstract to be more concrete and meaningful to understand. Studies in communications theory and system concept made some educationists to begin to look at the interrelationship between the teaching and learning process and its elements. Among the elements truly considered are the teacher, the teaching methods, the information conveyed, the materials used, the students and the student's responses. It was in terms of the study that emphasis shifted from not only the development of some instructional materials and devices to the use of the materials/devices during the teaching-learning process. This was when instructional materials/devices began to be viewed and appreciated as an integral part of the educational system. Whether the materials are commonly old or modern, they are known to facilitate perception of the most important features of any learning material. Furthermore, teaching and learning is enhanced when a learning material is organized in such a way as to make students receive information simultaneously in two modalities (vision and then hearing as examples) instead of in a single modality for reading). To Hannon (2000) there is an overwhelming assumption and proof to that with so much change in the learning resource landscape. There is the tendency for teacher to forget, discard or even neglect older learning resources as outdated, out-of-model, inefficient and inadequate for the delivering of instructions.

There are five social effects of climate changes in any society like Nigeria which is the information and ways of preventing or protecting ourselves from them are not disseminated to the students may serve in the future as crucial catalysis that will trigger off organized violence. Climate change may increase scarcity of certain/or fresh water resources, public food, goods and services, unemployment rate, loss of livelihood, and environmental struggle in addition to decrease in state income and economic activities. The above social effects will invariably lead to tension and conflict as witnessed in places like Dafur, Sudan, Chad and Jos among the cattlemen.

It explains why Buhang, Halvard, and Gleditch (2008) asserted that climate change may increase the risk of armed conflict only under certain conditions and in interaction with several socio-political factors. Climate change refers to the changing state of the earth's temperature and average precipitation (the cooling and freezing thawing) or climate.

Despite the prevalence and principal impression that charts are viable curriculum resource for enhancing effective delivery of instruction in schools and in areas as sensitive today as climate change, teachers in secondary schools seem not to be exploiting the use in facilitating their instruction. This is because in the face of the modern technology which the teachers may find some difficulty to have access to they still do not give enough attention to the use of charts in their classrooms. Anya (2001) asserts that it is surprising that despite the prevalence of this resource around the schools, resource-based learning has not been encouraged the effective instruction have not been promoted. It is therefore the aim of the work to ascertain the extent to which teachers utilize climate change adaptation practices charts as a healthy curriculum resource for effective instruction.

RESEARCH QUESTION/HYPOTHESIS

One research question and hypothesis were used in guiding the study and undertaking further analysis on the data collected and they are:

1. What are the teachers most commonly used climate change adaptation practices chart in delivering instruction in schools?

NULL HYPOTHESIS

There is no significant difference in rural teachers and urban teacher's use of the chosen climate change adaptation practices chart in their classrooms.

Research Design and Procedure

The study adopted a descriptive survey research design. Out of a population of 2632 junior secondary school teachers in Owerri, stratified and proportionate sampling techniques were used to categorize the schools selected into 1730 urban schools and 902 rural schools. From the selected schools 173 and 90 teachers were selected from each location respectively bringing thereby the total sample size to 263 respondents and which is approximately 10% of the population.

A survey and two sections questionnaire constructed by the researcher consisted of 15 items which were structured on a four-point likert scale of strongly agree (4 points) agree (3 points), disagree (20 points) and strongly disagree of (1 point). The items elicited responses which were used to answer the research question and further analyze the hypothesis on the extent of teacher utilization of climate change adaptation practices chart. The criticism and construct of some other experts in the same area of specialization helped the researcher to improve on the structure and content of the final questionnaire. On subjecting the questionnaire to about 40 teachers in the zone and adopting the test-reject method to ascertain the reliability to the study a coefficient of 0.99 was obtained which seemed satisfactory for the research work-while mean ratings and ranking of statistical techniques used on the research questions, the hypothesis was analyzed by using t-test statistical technique.

Data Analysis and Presentation of Results

Research Question 1: What are the teachers most commonly used climate change adaptation practices chart in delivering instruction in schools?

Table 1: Mean ratings and ranking of type charts teachers use in delivering instruction in schools.

TYPE OF CHART	Urban Teachers		Rural Teachers	
	X	Rank	X	Rank
Organization/relationship chart	2.87	1 st	2.65	1 st
Process/flowcharts	2.32	5 th	2.19	6 th
Occurrence/tabular charts	2.40	3 rd	2.31	5 th
Sequence/time charts	2.26	6 th	2.42	3 rd
Strip and flip charts	2.35	4 th	2.53	2 nd
Tree and stream charts	2.04	7 th	2.17	7 th
None of the above	2.46	2 nd	2.38	4 th

Table 1: reveals that the urban and rural teacher makes use of the organization or relationship charts in teaching some topics related to climate change. Most of the teachers as concerns other charts indicated either not using them at all or partly as seen in their means score which were below 2.50 it was the rural teachers who claimed or agreed that they use partly the strip and flip charts.

Research Hypothesis: There is no significant difference in rural teachers and urban teachers use of the chosen climate change adaptation practices charts in the schools. Table 2 t-test comparison of the mean ratings of teachers in various locations as a significance factor affecting them in the effective use of charts as a curriculum resource.

Group	NX	Sd	df	t-cal	t-cnt	P			
Urban Teachers	90	4.21	0.65	178	90	4.06	2.14	3.26	0.05
Teachers	90	0.61							

Table 2 reveals that the calculated t-value of 2.14 is less than the critical value of significance (df = 178). The decision is therefore to accept the null hypothesis. Thus, location of the teachers is not a significant factor affecting teachers, effective use of charts as a curriculum resource.

DISCUSSION, CONCLUSION AND RECOMMENDATION

The analysis of responses for the research question and hypothesis have clearly shown that most teachers have not been sufficiently exposed to the use of charts as indicated below in teaching our children about the climate change, global warming and ozone depletion. This explains why Brooke, Anderson, Anyers, Means and Nortan (2010), asserted that there are glaring inequities in the distribution of responsibility for the causes of climate change, global warming and the distribution of its impacts among the nations and peoples of the world. That the poor people in developing countries are worst hit by this development and they bear the brunt of its impacts while contributing very little to its cause. This according to them is because the poor countries are yet to be well informed about climate change the effects and the control.

Finally, this study established that the location of the teachers are not significant factors which affects the effective use of charts on climate change as a curriculum resources for delivery of instruction. It explain why Mcduel and Booth (1998) asserted that the location of a teacher does not necessary determine a teachers use of instructional materials but the teachers motivation, zeal and preparedness to do so.

CONCLUSION

It is clear that secondary school teachers in Owerri education zone do not effectively deliver their instructions on climate change with charts as a curriculum resource. This is because there are still some areas which they are glaringly weak and incapable of using the chart, when they are the commonest materials teachers can provide anywhere. There is need therefore to encourage the teachers to further explore the use of this material.

RECOMMENDATION

Borrowing the ideas of Brook, Anderson, Ayers, Burston and Tellam (2011), the study recommends as follows:

1. Training of teachers on how to use charts to teach our children to respond to adapt and mitigate impacts of climate change and related events.
2. Climate change priorities are integrated into national development strategy and findings.
3. Services of the teachers in the use of climate change charts should be extended to other people affected in our communities by climate variability.

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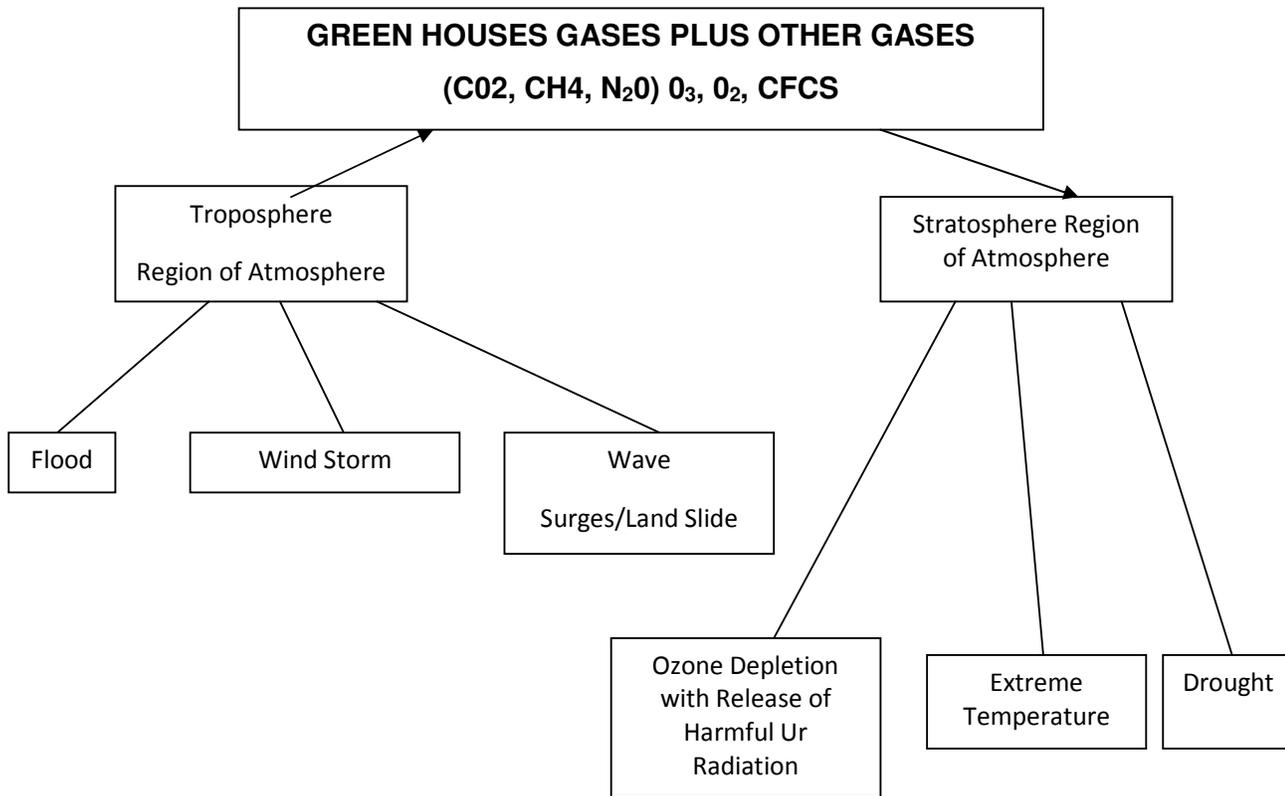
SAMPLE OF A COMPARISON TABULAR CHART ON CLIMATE CHANGE ADAPTATION PRACTICES ON POPULATION TOTAL IN AFRICA AFFECTED BY SELECT DISASTER CASES AS AT 2008 AND KILLED AND MADE HOMELESS.

Region	Sub Region	Droughts	Extreme Temperatures	Floods	Land slides	Waves/ surges	Wind storms
Africa	East Africa	1,765,088 (14%)	N.A	108,167 (2%)	562 (<1%)	27,556 (2%)	118,167 (3%)
	Middle Africa	374,726 (90%)	N.A	25,990 (<1%)	73 (<1%)	N.A	9,945 (<1%)
	North Africa	1,700,243 (7%)	40(<1%)	98,628 (<1%)	3323 (<1%)	12 (<1%)	24,402 (<1%)
	South Africa	295,531 (15%)	21 (<1%)	24,111 (1%)	34 (<1%)	N.A	48,314 (4%)
	West Africa	967,841 (22%)	333,359 (13%)	52,944 (<1%)	519 (<1%)	N.A	4,822 (<1%)

Source: authors, compilation, using CRED (2008) PROVISION

Note: N.A = not applicable in parentheses are the percentages by region and disaster, as a proportion of the national population during the year of the disaster 2008. Each disaster total is the total number of affected people including those killed and homeless by sub-region. Tabular charts carry numerical information or data. They are also used in showing time information as in school or lesson study time and examination time tables.

**A SAMPLE OF ORGANIZATION/RELATIONSHIP CHART ON CLIMATE CHANGE
MULTIPLE CAUSAL FACTORS AND THE MULTIPLE IMPACT/EVENTS**

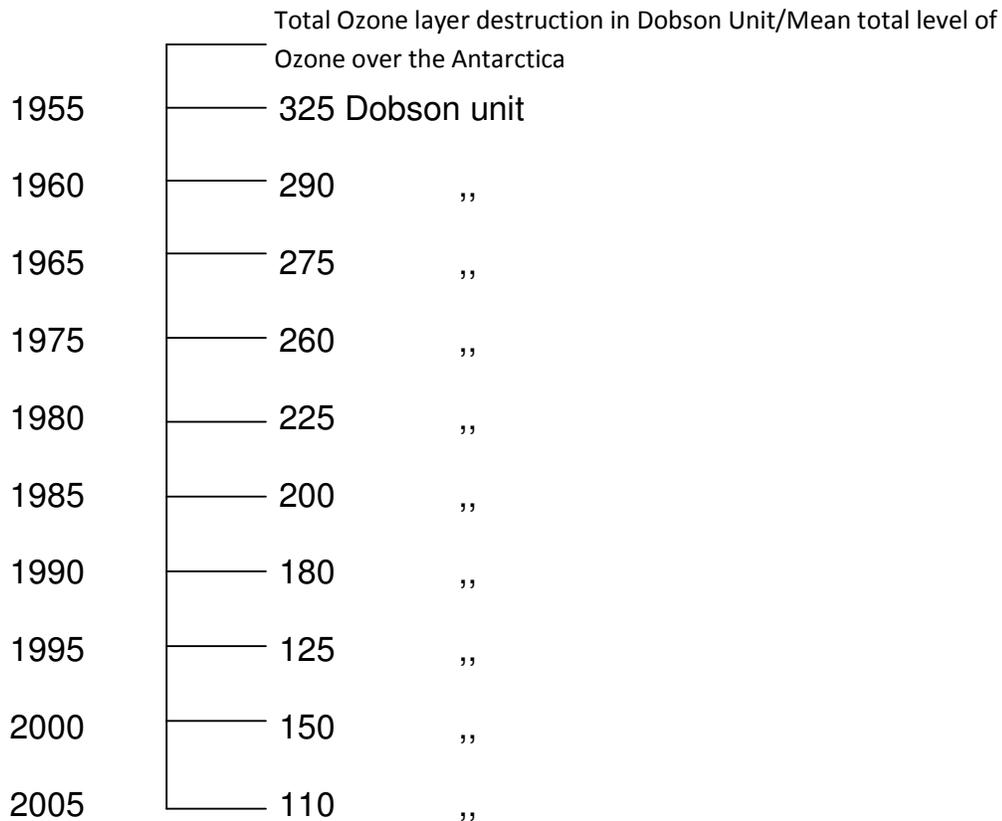


SOURCE: Author's Illustration

Organization chart is used to show relationship or "claim of command" in an organization. It also can be used to illustrate the structure of an organization, an institution, a company or government department. It illustrates the organization and flow of authority in an organization from the head down the line to the bottom.

A SAMPLE OF TIME AND SEQUENCE CHART ON RATE TREND AND ORDER AT WHICH OZONE LAYER IS BEING DESTROYED TO CAUSE CLIMATE CHANGE BETWEEN 1955 AND 2005 IN DOBSON UNITS.

YEAR



SOURCE: Miller Tyler G. Jr. Research Work (2005)

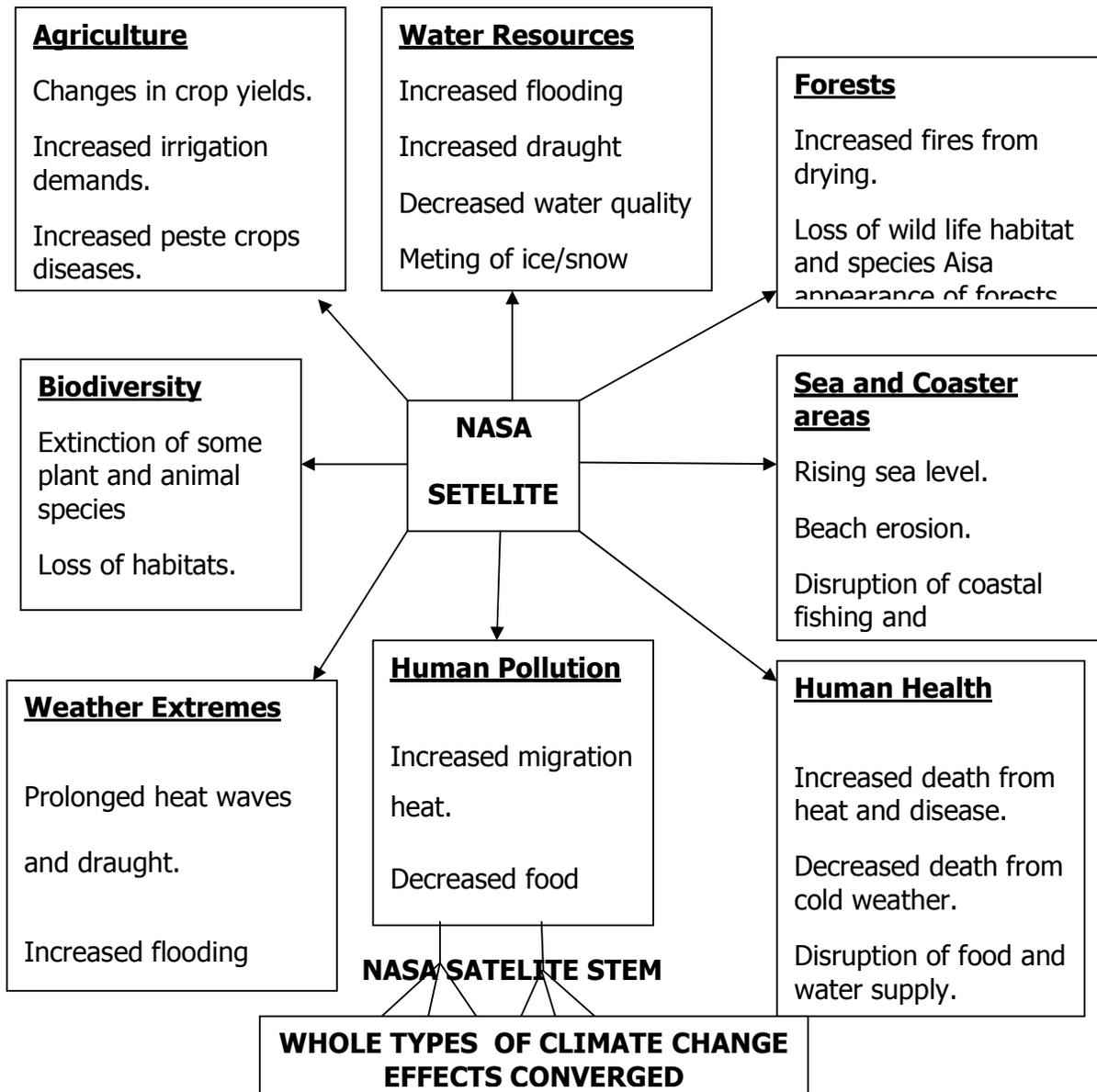
Time chart is used to show the developmental stages or trend of an event such as climate change, global warning and ozone depletion. Here, the land mark events are identified and arranged in chronological order. Pictures drawings and graphs can be added to the time line to illustrate important events or major stages of development. The loss of ozone above Antarctica is often called an ozone-hole or thrima.

A SAMPLE OF STRIP AND FLIP CHART ON METHODS OF TRACKING AND SLOWING DOWN CLIMATE CHANGE EFFECTS/GLOBAL WARMING

1	Presenting pictures of the following to present and clean up global warming	<ul style="list-style-type: none"> - Removing CO₂ from smoke sticks individual areas and vehicle emissions - Planting certain trees to store or sequester CO₂ (Carbon dioxide) - Reducing deforestation activities. - Using no-till cultivation and crop and out of production sequester CO₂ in the soil - Using more to provide techniques for sustainable agriculture
2	Presenting pictures of the following to prevent and clean up global warming	<ul style="list-style-type: none"> - Cutting the use of fossil fuel especially coal - Shifting from the use of coal to the use of natural gas. - Shifting from use of non-removable to renewable energy resources - Transferring of energy efficiency and renewable energy technologies to developing countries.
3	Presenting pictures of the following to prevent and clean up global warming.	<ul style="list-style-type: none"> Improving on energy use efficiency Slowing down the population growth Limiting urban sprawl Reducing poverty Provision of Drainage systems
4	Presenting pictures of the following to prevent and clean up global warming	<ul style="list-style-type: none"> Using of feeds which reduces CH₄ (methyl) or methyl bromide emission by belching cows. Repair of leaking natural gas pipelines and facilities Requesting of CO₂ in the Deep Ocean and deep underground.

Strip and slip charts are ideally used for teaching topics which have phases in order to expose each part at a time. The strip chart is a single chart which has the component parts covered with strips of paper and the strips of papers are removed at appropriate times on exposing some concealed information. The flip chart is the chart which contains more than one sheet/strip chart and each chart dealing with a specific phase, stage, method and tracking technique. It is also used in teaching the stages of some plants, and animal life cycles. As a teacher proceeds, he/she flips open the sheets one after the order. The phase under study helps to conceal the previous and next sheet. It helps to prevent distraction and encourage students to focus attention on one event at a time.

A SAMPLE TREE AND STREAM CHART ON EFFECTS OF CLIMATE CHANGE IN DIFFERENT PARTS OF AFRICA/WORLD



Tree and stream charts are used to show branching sub-division of the effects of climate change in different parts of the world. By the above diagram we are seeing several small sources of effects or tributaries finally converging to form a single stream of effect and the NASA Satellite.

A SAMPLE OF THE PROCESS/FLOW CHART ON HOW UVRADIATION FROM SUN REACTS WITH CHLOROFLUORO CARBONS (CFCS) AND OTHER CHLORINE-CONTAINING COMPOUNDS IN DESTROYING OZONE LAYER IN THE STRATOSPHERE FASTER THAN IT IS FORMED THEREBY CAUSING CLIMATE CHANGE.

