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Full Length Research Paper

Global warming and implications for senior secondary school (SSS) geography in Nigeria

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The objective of the paper is to look into the current syllabus of the SSS geography and identify for attention, modules, topics and other items that must change in the face of global warming. The SSS geography syllabuses were reviewed. Subject teachers and examiners were interviewed on the scope, content and what must change in the face of global warming. There were some discussions with teachers of Geography. Climate elements, vegetation, ecosystems and niches, agricultural practices, crop yields, rivers and their seasonality behaviour, animal rearing and management, human behaviour and others call for attention in the syllabus. There were some radical departures from the details found in texts and examined, and the actual. The syllabuses must identify with those salient aspects of the subject whose specific content need to be modified and/or changed and adjusted for teaching and learning. Elaborate environmental education is suggested.

Keywords: Global warming, climate change, senior secondary school, geography, Nigeria.

INTRODUCTION

Background to the Study

The relevance of geography and geographic studies cannot be over emphasised (Fellmnan, Getis and Getis 2005, Ologe 1978, Areola 1978, Aderogba 2005 and Aderogba and Ogunnowo, 2010). Boehim 1996 put in tabular form eight major fields of concentration in geography and employment opportunities, Appendix A. Apart from its being offered at the SSS for Senior Secondary School Certificate Examination, it is a discipline taught at the university level and it combines with several other school subjects to make professions and professional.

The West African School Certificate Examination Council (WAEC) has reviewed its syllabi over the years to reflect contemporary issues, respond to public concerns and adjust to realities of time, (Aderogba and Ogunnowo, 2010). The National Examination Council (NECO) also fashioned its syllabus closely to the WAEC. See Appendix B. The appendix shows details of geography syllabus as provided by the two national examination bodies and implemented by schools and colleges. The aim and objectives of the programme taught at this level are (West African Examination Council, 2004):

To understand the concept of different characters and the spatial relationship of the features on the earth surface;

To understand the concept of man-environment relation, that is, to examine and explain the interaction of man with his physical and cultural environment;

To acquire the basic knowledge of the nature and function of physical and human environments and understanding of their inter-relationships on the resulting issues;

To organize and formulate principles according to acquired geographical concepts and apply these

principles to interpret and analyse spatial problems in the immediate and wide environment; and

To develop skills and techniques for accurate orderly and objective geographical investigations to be carried out both in the classroom and in the environment.

The programme of study span through a period of nine terms, that is, three academic sessions. The breakdown of the content is modularized into six, namely: Elements of Practical Geography (Map Work); Physical Geography; Human Geography; Regional Geography of West Africa with particular emphasis on Nigeria; Geography of Africa; and Filed Work. Again, Appendix C shows the list of books used by both teachers and students to effect the teaching and learning about each aspect (module) of the subject.

Incidentally, geography is a study of man – environment interact; but the environment is fast changing (Hansen, Schnitzler, Strasmann, Doney and Roeckner 2007; Choi and Fisher, 2003; Fellman, Getis and Getis 2005; and Botkin, Fungi, Bala and Jones 2007). The changes are brought about directly and indirectly by man and the depleting ozone layer that is consequently leading to global warming and climate change, (Hasen et al 2007). According to them and Fahey (2007), the initial step in the depletion of stratospheric ozone by human activities is the emission, at earth's surface, of ozone- depleting gases containing chlorine and bromine. Most of these gases accumulate in the lower atmosphere because they are un-reactive and do not dissolve readily in rain. Eventually, these emitted source gases are transported to the stratosphere, where they are converted to more reactive gases containing chlorine and bromine. Finally, when air returns to the lower atmosphere, these reactive chlorine and bromine gases are removed from the earth's atmosphere by rain. The ozone in the atmosphere absorbs some of sun's biologically harmful ultraviolet radiation. Because of this beneficial role, stratospheric ozone is considered "good" ozone. In contrast, excess ozone at earth's surface that is formed from pollutants is considered "bad" ozone because it can be harmful to human, plants, and animals. The ozone that occurs naturally near the surface and in the lower atmosphere is also beneficial because ozone helps remove pollutions form the atmosphere. All of these sum-up to be that direct rays of ultraviolet (UV) - B radiating from the sun is reaching the earth directly and with greater impact.

The ozone depletion itself is not the principal cause of climate change (Fahey, 2007). According to him, because ozone absorbs solar radiation and is a green house gas, ozone changes and climate change are linked in important ways. Stratospheric ozone depletion and increase in global troposphere ozone that have occurred in recent decades both contribute to climate change. These contributions to climate change are significant but small compared with the total contribution from all other green house gases. Ozone and climate change are indirectly linked because both ozone-depleting gases and substitute gases contribute to climate change, (Walther, Post, Convey, Menzel, Parmesan, Trevor, Jean-Marc, Hoegh- Guldbery and France 2002, and Seinfeld and Pandis, 1998). Hitherto industrialization, these have been there but very mild. The situation is getting magnified and compounded with industrialization and various other activities of man that are giving rise to emission of ozone depleting gases. These have been impacting very severely on the environment of man, (Fahey 2007, Seinfeld et al 1998, Walther et al 2002, Hansen et al 2007)

In view of the global warning and its impact on man and his environment, what then may be the effects on the content (and scope) of geography and materials that must be used to effect the teaching and learning about cotemporary geography at the SSS. In other words, regardless of benefits and disadvantages, the consequent impact on earth's warmth (global warming and climate change) on the environment and the Geography taught require attention for sustainability of the subject; and thus the objective of this work. That is, to examine how it may affect the content, scope, facts and figures in the school geography that may require adjustment and or caution to teach and learn about.

MATERIALS AND METHODS

The country lies within the tropical region of West Africa with an area of 913,071 km^2 with a latitudinal extent of 10 degrees, from approximately 4^0 N to 14^0 N. She has a variety of physical conditions.

The vegetation type typically reflects rainfall patterns, soil types and variations in altitude. In general, rainfall diminishes from the south and south-east towards the north. The coast has rain during all months of the year while the north has rain for approximately half of the months of the year. The rainfall follows the hinterland movement of the moisture-laden south-west winds. It is essentially convectional. Double maxima occur in the south while a single maximum occurs in the north. In the costal regions, the annual rainfall is of the order of 4,000mm dropping to about 500mm in the extreme north. The assured supply of rainfall, especially during the raining season, and the consistent high temperature throughout the year make for plant growth everywhere, (Afolabi, 1973: 25).

Throughout the coastland is dense *mangrove forest*. It is fairly extensive in the Niger Delta. *Evergreen rainforest* occurs inland from this. It has a considerable number of tree species, wood climbers, creepers and undergrowth. Mainly because of soil characteristics, a zone of oil palm bush breaks the west to east belt of the high rain forest in parts of the Eastern states. The *derived savannah* which is found next to the rainforest belt is usually regarded as rainforest modified by human activities especially

extensive farming. The remaining parts of the country to the north are covered by a variety of *savannah vegetation* ranging from the Southern Guinea Savannah through Northern Guinea savannah and Sudan Savannah. Adamawa highlands and region around Jos Plateau have *Mountain forest*. All over, these have been tampered with by man. What are found in most places are cultigens, distorted forest and savannah grasslands.

In broad terms, the south is essentially a zone of tree and root or tuber crops. The middle belt is of mixed root and grain crops. The north is predominantly for grain crops. According to Afolabi (1973: 27) "obviously, this pattern is related to the rainfall distribution in terms of its quality and dimension". The same way Dow and Downing (2007; 11-27) assert in their book *The Atlas of Climate Change: Mapping the World's Greatest Challenge.*

Apart from the ones that are found dotting the outskirt of major cities and towns, manufacturing and other industrial processes and productions are most concentrated at the Lagos Sango/Ota-Abeokuta-Ibadan industrial axis, Kano-Kaduna-Jos triangle, Assaba-Onitsha-Benin-Sapele-Wari Sector and Aba-Port-Harcourt-Enugu-Onitsha-Owerri Complex.

Literature on ozone, ozone depletion, global warming and consequences on man, plants, animals and generally on climate change were read. Weather elements were studied and empirical investigations were carried out on plants, animals, and physical elements of ecosystems and niches. These were studies for a period of five years. Agronomical measurements of soil attributes were similarly observed, studied and analysed. Forest rangers were interviewed and so also traditional and modern (mechanised) farmers. All of them commented on the structure, composition and sizes of forests and grasses, planting harvesting of crops and crop yields.

Human activities in two cities and towns each of the six geographical zones of the country were studied, namely:

North – west	-	Sokoto and Katsina
North – east	-	Yola and Maiduguri
North – central	-	Kaduna and Mina
South – west	-	Abeokuta and Ondo
South – east	-	Onitsha and Enugu, and
South – south	-	Port -Harcourt and Warri

Longman (2005) Senior Secondary School Atlas and Macmillan (2006) Senior Secondary Schools Atlas (Duze and Atolabi, 2000) in Nigeria were used side by side with the books/ literature recommended for use to implement the syllabus. Appendix C shows the list of books. There are, at least, two books each addressing each of the modules. There are, at least, two books addressing each of the modules.

Each of the zones were picked one after the other, and the atlas maps, contents of the texts and physical observation were compared. All topics and chapters of the tests and reference materials were perused to identify those areas/ aspects that have been affected and/or way be affected by the global warming and climate change, and thus probably render them obsolete or otherwise for effective sustainable teaching and learning about a sustainable geography for SSS in Nigeria.

Schools teachers of geography and examiners were interviewed to seek for their opinions on the content of the subject that might have been affected by the global phenomena based on their class experiences, materials used and their perceptions of the physical environment. They were able to enumerate, describe and make suggestions on salient areas that have been affected in content and accuracy of facts and figures.

Miscellaneous, uncertainties and contentious areas were identified and suggestions made. Similarly, the students of SSS 3 in three randomly selected public schools and five private schools each from the identified geographic zones were interviewed on the contents, facts and figures in text books, reference materials, and lessons learnt in the classes of geography. Notes of lessons of teachers of geography from those school and colleges on geographic topics for SSS 1, SSS 2 and SSS 3 were perused to examine how much of the impact of global warming have been affected of the facts and figures and others that are taught; and to what extent the teachers and the syllabuses have adjusted to these changes.

Examination questions, answer scripts and marking guides were perused and useful information and facts were derived. Responses, facts and information and suggestions from these sources form substantial part of this work. There were no statistical quantitative analyses carried out.

RESULTS

There are a number of manufacturing, processing and packaging industries whose wastes as effluents and solid wastes are contributing to environmental pollution. Bush burning, heating at homes, small scale industries, exhausts of automobiles and electricity generators, chimney and others contribute to pollution and heat and global warming resulting from depleting ozone layer. Urban growth and development are resulting in urban processes, structures and other phenomena that are daily impacting on micro climates of the different sizes of settles in different ways. The general increase in global average air and ocean temperature, widespread melting of snow, and rising sea levels led the Intergovernmental Panel on Climate Change (IPCC) to report, in February 2007, that "warming of the climate system is unequivocal." Dow and Downing (2007) have also submitted thus:

> The world is experiencing increasingly uncommon weather, and implications for day-to-day life are becoming more apparent. Naturalists' observation of animal and plant behaviour suggest that ecosystems

> are already being forced to adjust. In April 2007, the IPCC stated with "high confidence" that recent warming has affected terrestrial, marine and fresh water biological systems, glaciers and rivers. Based on an analysis of over 29,000 data sets, contained in 75 studies from around the world, it concluded that over 90 per cent of the observed changes were consistent with climate change.

They went further to emphatically assert that

> A single extreme weather event or change in the natural environment does not prove that human are changing the climate. However, the proven physical science, the history of recent observations, and the consistency in model assessment all support only one explanation: The emission of greenhouse gases by human activities is causing profound changes to the climate system and to the world we live in.

Nigeria is not an island from the rest of the world; and the Geography of Nigeria taught in schools and colleges. The consequences for certain facts and contents of topics in geography and geographic studies are enormous. It is strong opinion of all students that geography is too wide in scope and content; and so it may be difficult to identify all aspects of the subject that require attention in view of the global warming. However, common to all of the groups, - students, teachers, examiners, and students are the following areas of concern:

Physical features e.g. coastal features and other land forms that have changed in shape, size depth and heights. Most of the determined and known height have gradually changed;

Urban structures, constructions and reconstructions and others have increased, erosion, surface run offs and others have increased

Temperature and pressure on the average do not remain what are in test books and reference materials as temperature is relatively higher on the average days and nights during hot seasons when urban dwellers, drink more (water and other drinks), shower and stay under water for longer period; prefer lighter dresses, seek for cool rooms and/or offices and prefer more ventilated living apartments and offices;

Vegetations have changed in composition and area extent. The ecosystems and niches are fast changing: aquatic is assuming characteristics of terrestrial types of ecosystem, for example;

Rainfall, dew and relative humidity (RH) have shown great departure from what are in the texts, reference materials and contents taught in schools and colleges – rainfall is decreasing, relative humidity is decreasing dew is decreasing and temperature is relatively higher, giving an inclement warmth;

Rivers and streams carry more loads with wider width and increased volume of water;

The courses, and of course, the length of some of the rivers and streams have increased while others have shortened. There may be no one that will remain the same; Agricultural practices have changed with predominant weather conditions, soil types, high breed crops and new technologies;

Crop yields have drastically dropped in many cases, new varieties of plants/ crops, birds and animals have been introduced while some are gradually going into extinction in some localities because the environmental conditions can no longer support the species;

Climate change coupled with overgrazing, over cropping and continuous chemical applications, have turned the soil types to "man-made," and highly impoverish at some places;

Lakes, pounds and swamps have dried up and a few have retreated; and the seasonality characteristics of the streams and rivers have changed;

Rocky systems have changed/ reduced in size, height, shape and area extent and some of the metamorphic rocks have further metamorphosed;

Solid wastes are generated more and the consequences of poor disposal and management have been compounding pollution situations that are also warming the atmosphere and more hazardous to lives and property;

Dusts are being generated than ever before and these are fast leading to ozone depletion, global warming and climate change. More seriously, cases of lung disease and associated ailments are now common;

Length of seasons (dry/hamattan and wet seasons) have drastically changed and so also the period each lasts;

The hammatan is particularly too mild but more dusty, and it lasts for shorter period of time;

Many roads and routes (particularly water ways and air ports are existing but not in any text;

New human diseases and ailments are now reported in hospitals and at homes while some have probably gone into extinction and others are exhibiting new symptoms requiring new treatments;

Also animals and plant diseases are exhibiting new symptoms and demanding new treatments.

The foregoing has enumerated a few of the observed changes in the environment of man: weather, climate, vegetation, soil type, crops and crop yields, animal rearing, urban growth and development and others. But they have not been reflected as significant as they are in any text or reference materials. Interestingly, over 85 per cent of the materials and texts were printed before this century not to talk of revisions. They may therefore be regarded as inadequate.

DISCUSSION

The text books and reference materials for this bit of geography and for this level of education are inadequate, obsolete and sometimes out rightly irrelevant. Even at that, those listed are not properly identified with authors, titles, publishers, editions, dates of publications, and country / cities of publications. Teachers have no

confidence in the content they teach and examined. Sometimes, they are unable to agree on popular/ correct/ consensus for specific questions and answers, and concepts and examples for purpose of examinations. Some other times, consensus could not match the observed.

All of the aforementioned may not be direct effect of global warming but inadvertently they have contributed to a great extent, (Fellman, Getis, and Getis 2005, Ogunnowo and Aderogba 2006, and Palutikot and Agnew 1996) to the 'changing face of the world".

Global warming is not localized to Nigeria, it is global. Therefore these challenges are not peculiar to Nigeria but the world. The dimensions may differ significantly or otherwise from one country to another and from one region to another. Though the ultimate is to understand what needs to be taught when and where, there must be further researches to confirm and or dispel some of the claims.

RECOMMENDATION AND CONCLUSION

The foregoing has established that the SSSC geography had undergone some review to address yearnings of members of the public and adjust to realities of time. The need for another review is obvious. The SSS lays the foundation for geography – be it applied or other wise; and geography must continue to find its relevance as a school subject and subsequently as a discipline; and for societal sustainability in the environment man finds himself. It has also been established that the ozone depletion is leading to global warming, changes in weather elements and climate change. These changes have not been reflected in the texts, reference books and other materials used for teaching and learning about Senior Secondary School Geography. The content of the subject should therefore change and or be adjusted with the changes in the elements and processes in the environment, that is, as the element of the environment have been affected by the global warming and other incidentals.

Generally, environmental education should be given special attention not only to students of geography but generality to students of SSS classes. They need to be educated about the changing environment of man. Also such environmental education should be extended and given adequate attention through non formal education to the generality of the citizens. The adverse consequences of global warming should not meet individuals and groups unaware, and the benefits of it should not elude any. Thus, massive education about global warming, its impacts on the geography and the environment generally is eminently imperative. These must be addressed in the Environmental Education syllabuses.

Though it may remain herculean task, text books, atlases and other reference materials in use must be updated in content, accuracy of facts and figures, rewritten and published within the next two to three years. Otherwise, they should become obsolete and irrelevant for teaching and learning about geography of SSS. The Federal and State Ministries of Education should set limit for continuous usefulness of these old books and reference materials. New text books and materials that will address the global issues must be written and published to reflect Environmental Education, man-environment interaction and the changing face of the earth. Governments, government parastatals, agencies and institutions will need to work in collaborative efforts, commission individuals and groups to address these as project that may be titled "Progress in Geography."

Teachers of geography, geography laboratory assistants and the examiner should hold workshops, seminars and conferences that should address these challenges. The Association of Nigerian Geographers (ANG) has a significant role to play in these regards: The association would have to work in collaborative efforts with the governments, examination bodies - WAEC, NECO and JAMB in particular – the teachers and other stakeholders to challenge the challenges of global warming in all ramifications. Also, facilities and amenities for effective teaching and learning about the subject should be upgraded and updated and made available by governments. Philanthropies may have to wake into these national calls. Though the developed world is working towards zero emission, it should be remembered that as long as the ozone layer is being depleted and there is global warming and climate change, the face of the earth will keep on changing. Books and materials for teaching and learning will keep on calling for attention for either revision of the existing ones and/or writing and publishing new ones. There may be further investigations to establish elements of geographic topics that have been affected and/or may be affected.

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APPENDIX A

Major Geographic Fields and Employment Opportunities

Major Fields of Concentration	Employment Opportunities
Cartography and Geographic Information System	— Cartographer for Federal Government (agencies such as Defence Mapping Agency, US Geographical Survey or Environmental Protection Agency or Private Sector (e.g. Environmental System Research Institute, Integral or Bentley); Map Liberian, GIS specialist for Planners, land developers, estate agencies, local government,
Physical Geography	remote sensing analyst, Surveyor. —Weather forecaster; outdoor guide; coastal zone manager; hydrologist; soil conservation/agricultural extension agent.
Environmental Studies	— Environmental manager; forestry technician; park ranger; hazardous
Cultural Geography	waste planner. — Community developer; Peace corps volunteers; health care analyst.
Economic Geography	— Site selection analyst for business and industry; market researchers; traffic/route delivery manager; real estate
Urban and Regional Geography	agent/broker/appraisers; economic development researcher — Urban and Community Planner; transportation planner; housing,
Regional Geography	park and recreational planner; infrastructure and services planner. — Area specialist for Federal and State Government; International
Geographic Education or General Geography	business representative; travel agent; travel writer. — Elementary/Secondary School teacher; College Professor, Overseas teacher.

Source: Career in Geography "By Richard G. Boehim. Washington DC: National Geographic Society, 1996

APPENDIX B

The West African Examination Council (2004) Regulations and Syllabuses.

Contents	Notes
Elements of practical and physical geography Map Work	Map reading and interpretation based on a continuous survey map of part of West Africa: scale, measurement, distances, direction and bearing, map reduction and enlargement, identification of physical features such as spurs, valleys etc and cultural features such as city, walls, settlements, communication routes etc, measurement of gradients, drawing of cross profiles, inter-visibility, description and explanation of drainage patterns of communication settlement and land use.
Elementary Survey	Chain and Prismatic compass, open and closed traverse avoiding obstacles in the field.
Statistical Maps and Diagrams	Graphical representation of statistical data: Bar graphs, Line graphs, flow charts, pie charts, dot maps, proportional circles, density maps, isopleths maps.
Elements of Physical Geography	The earth as a planet in relation to the sun. Latitude, longitude and time. Structure of the earth (internal and external).
(i) Rocks	Types, characteristics, formation and uses.
(ii) Major Landforms	Mountains, plateaus, plains, karst and coastal landforms.
(iii) Oceans	Agencies modify landforms such as weathering, running water, underground water, wind and waves.
(iv) Weather and climate	Fieldwork covering local landforms such as coastal features, drainage features, gullies, etc.
(v) Elements of climate	Ocean basins, salinity, ocean currents (causes, types and effects on the climates of coastlands), water as an environmental resource.
(vi) Soils	Simple weather study based on local observation description of the Stevenson's screen and uses of basic weather instruments e.g. rain gauge, thermometer, barometer and wind vane etc.
(vii) Vegetation	Temperature, pressure, wind and precipitation and the factors affecting them e.g. altitude, latitude, ocean currents, land-and-sea breezes, continentality, aspect. Interpretation of climatic charts and data. Classification of climate (Greek and Koppen's).
(viii) Aspects of Environmental Interaction	Major types of climate (Hot climate – equatorial, tropical and desert, temperate climate – warm and cool). The atmosphere as an environmental resource.
(ix) Environmental hazards	Definition, local types and characteristics. Factors and processes of soil formation and soil profile. Tropical soil types. Importance to man and the effects of human activities on soil.
HUMAN GEOGRAPHY	Major types (tropical rainforest, cool temperate, woodland, tropical grassland and temperate grassland); characteristics, distribution, factors affecting their distribution, plant communities. Vegetation as an environmental resource.
(i) World Population	Land ecosystem, environmental balance and intervention within the natural environment.
(ii) Settlement	
(iii)	
(iv) Transportation	
(v) Manufacturing Industry	
(vi) World Trade	

REGIONAL GEOGRAPHY OF NIGERIA	Soil erosion, drought, desert encroachment, deforestation and pollution, causes, effects and prevention of each. Factors and patterns of growth, distribution and movement; growth rate problems (e.g. Amazon asin, N.E. of USA, India, Japan, West coast of South Africa) Types (rural and urban); patterns and factors affecting location; growth and size; functions of rural and urban settlements (e.g. Western Europe, the Middle East and West Africa). Types (roads, railways, water, air). Transportation and economic development (movement of people and commodities,
FIELDWORK GEOGRAPHY OF AFRICA SELECTED TOPICS	national and international trade, diffusion of ideas and technology, national integration); problems of transportation. Types (heavy and light industry); Factors of industrial location; contributions to Gross National Product (GNP) and problems. Factors, major commodities (agricultural, manufactured goods and mineral products, trade routes, with special emphasis on trade between candidate's home country and the outside world. Nigeria on broad outlines (location, position, political divisions, physical setting, population distribution of mineral and power resources, ???? industry and commerce, transportation). Geographic Regions of Nigeria (Eastern Highlands, Eastern Scarp lands, North-central Highlands, Sokoto Plains, Chad Basin, Niger Trough, Cross River Basin and Southern Coast. Each of these geographical regions should be under the following sub-headings:- (i) Physical settings; (ii) Peoples and population; (iii) Resources and economic activities; (iv) Transportation; (v) Problems of development. Field work on any one of the following should be based on local geography of candidate's home country. (This aspect of the syllabus should be examined in schools as part of the continuous assessment and should account for 25% of the total mark ????? continuous assessment): (i) Land use (rural or urban): Rural – crop farming (e.g. rice, cocoa etc), mining (e.g. coal, tin, petroleum etc), fishing. Urban – commercial activities, ports, factories, recreational etc. (ii) Market survey – rural or urban (iii) Traffic flow – rural or urban (iv) Patterns of journey to work – rural or urban (v) Rate of erosion in the locality etc Africa on broad outlines – location, size, position, political divisions and associated islands, physical setting (relief, drainage, climate and vegetation); distribution of major minerals. (a) Lumbering in equatorial Africa (with particular reference to Cote d'Ivoire and Zaire). (b) Irrigation agriculture in the Nile Basin and the Niger Basin. (c) Plantation agriculture in West and East Africa. (d) Fruit farming in the Mediterranean Regions of Africa. (e) Gold mining in South Africa. (f) Copper mining in Zaire and Zambia. (g) Oil production in Nigeria, Algeria and Libya. (h) Population distribution in West Africa. (i) International Economic Co-operation in West Africa (e.g. ECOWAS).

Source: West African Examination Council (2004) *Regulations and Syllabuses for Senior School Certificate Examination (SSCE) for Candidates in Nigeria.* Lagos: WAEC pp 248 – 255.

APPENDIX C

Suggested Reading List

S/N	Author	Title	Publisher
1	T. E Hilton	Practical Geography in Africa	Longman
2	D. A. Nimako	Map Reading for West Africa	Longman
3	A. Ogunseye & A. Faniran	Map Reading and Interpretation for West Africa	Nainemanu
4	Monkhouse F. J & H. R Wilkinson	Maps and Diagrams	Methuen & co Ltd
5	Bygott John & D. C Money	An Introduction to Map work & Practical Geography	University tutorial press.
6	Pritcharel J. M.	Practical Geography for Africa	Longman
7	Goss W. E	Surveying	Macmillan
8	Dotes, J. M.	Practical Geography (Map work)	University of cape co. press
9	J. Willmer & Okoye	Map Reading and Interpretation	
10	R. B Bunnett & P. O Okunrotifa	General Geography in Diagram for West Africa	African university press
11	B. O. Adeleye & G. C Leong	Certificate Physical and Human Geography (West Africa edition)	Longman
12	A. Faniran & O. Ojo		Oxford
13	Strahler A. N	Mans' Physical Environment	Heinemann
14	Monkhouse F. J	Introduction to Physical Geography	Willey international edition
15	Gates	Principle of Physical Geography	
16	Small R. J	Climatology and Metrology	University of London
17	Patton Clyde et al	The Study of Land Forms	
18	Alistaire pitty	Physical Geography	Cambridge university press
19	Dickson J. P et al	Introduction to Geography	
20	Adejumo J. C.	A Geography of the Third World	Word worth publishing co.
21	Gil Mor D. A	An Introduction to the Geography of the Tropics	Methuen & co Ltd
22	Udo Reuben K.	Socio- Economic Geography	Longman
23	Udo Reuben K.	The Human Geography of Tropical Africa	Nelson & sons Ltd
24	Udo Reuben K.	Comprehensive Geography of Tropical Africa	Gil and Moc Ltd
25	N. P. Iloeje	Geographical Regions of Nigeria	Educational books of Nigeria
26	M. A. Abegunde	A new Geography of nigeria (new edition)	
27	P. O. Okunpptifa & Michael Senior	Senior Secondary Geography Series (1-3)	Longman
28	BarBour K. M. ,Oguntoyinbo J. S.	A regional Geography of Africa (New Edition)	Longman
	Onyemelukwu J & Nwafor J. C	Nigeria in Maps	Longman
29			Longman
30	Diction K. B & Benneh G.	New Geography of Ghana	Longman
31	Engmann E. V. T.	A Population Geography of Ghana 1850 – 1960	Hodder & Stoughton
32	Dickson & Achempong	Geography of Senior Secondary School in Ghana	
33	Oboli H. O. N	An outline Geography of West Africa	Ghana University Press
34	J. I. Clarke	Sierra Leone in Maps	Ghana University Press
35	Gwuyn Jones	A New Geography in Sierra Leone	Ghana University Press
36	Pritchard. J. M.	Africa	Harrap & Company
37	M. Duze & Afolabi Ojo	Macmillan Senior School Atlas	Hodder & slough ton
38	Collins	New Secondary Atlas	Longman
39	Philips	World Atlas	Longman
40	Clary Audrey N.	Longman Dictionary of Geography (Human & Physical)	Macmillan
41	Moore. W. E		Longman
	Hayward & Oguntoyinbo J. S	A Penguin Dictionary of Geography	
		Climatology of West Africa	Longman
			Heinemann.

Source: The West Africa Examination Council (2003) *Regulations and Syllabuses for West Africa Senior School Certificate Examination (WASSCE)* Yaba: WAEC. Pp 270 – 272.