IMPACT OF PARTICIPATORY NON-FORMAL ENVIRONMENTAL EDUCATION PROGRAMME ON ADULT LEARNERS' ENVIRONMENTAL KNOWLEDGE, ATTITUDE AND PRACTICES IN OYO STATE, NIGERIA.

BY

FLORA OBIAGERI NKIRE
B. A. (Michigan) PGDE, M. Ed (Ibadan)

A Thesis in the Department of Teacher Education,
Submitted to the Faculty of Education
in partial fulfillment of the requirements for the Degree of

DOCTOR OF PHILOSOPHY

of the

UNIVERSITY OF IBADAN

August, 2012

ABSTRACT

Nigerian environment has been threatened as a result of human activities and natural disasters. This is worsened by the ignorance of the importance of environmental resources in their natural forms and lack of awareness of the consequences of peoples' behaviours due to poor environmental literacy and knowledge. Most of the previous attempts at modifying people's environmental knowledge, attitude and practices were directed at students in the formal education sector while the peripheral attention paid to the non-formal sector was basically non-participatory. This study, therefore, determined the impact of a participatory non-formal Environmental Education (EE) programme on adult learners' environmental knowledge, attitude and practices. It also investigated the moderating effects of level of participants' education and gender on the dependent variables.

The pretest, posttest, control group, quasi-experimental design with a 2x2x2 factorial matrix was adopted for the study. One hundred and fifty-four non-formal adult learners in intact classes of JS1 to SS1 from two adult literacy centres in Oyo State were purposively selected for the study. The two adult literacy centres were randomly assigned to experimental and control groups and the study lasted twelve weeks. Six instruments were used: Participatory Non-formal Environmental Education programme; Instructional Guide for the Participatory Non-formal Environmental Education Programme; Conventional Lecture Method Guide (stimulus); Environmental Knowledge Test (r=0.79); Environmental Attitude Questionnaire (r=0.83) and Environmental Practice Questionnaire (r=0.78). Seven null hypotheses were tested at 0.05 level of significance. Data collected were analysed using Analysis of Covariance (ANCOVA).

There was a significant main effect of treatment on non-formal adult learners' environmental knowledge ($F_{(1,153)}$=209.30; $p<0.05$). Learners exposed to the participatory non-formal environmental education programme performed better ($\bar{x}$ =18.95) than those in the

conventional lecture ($\bar{x}$ =8.48). Treatment also had significant effect on non-formal adult learners' environmental attitude ($F_{(1,153)}$ =106.25;p<0.05).The participatory non-formal environmental education programme was more effective in developing positive attitudes ($\bar{x}$ =69.10) than the conventional lecture ($\bar{x}$ =49.24). Also, there was a significant effect of treatment on non-formal adult learners environmental practices ($F_{(1,153)}$=5.386;p<0.05).Learners in the participatory non-formal environmental education programme performed better in environmental practices ($\bar{x}$ =63.60) than those in the conventional lecture ($\bar{x}$ =59.06). Level of participants' education had a significant effect on their knowledge of EE ($F_{(1,153)}$= 6.80:p<0.05). Participants with higher education obtained a higher mean environmental knowledge scores ($\bar{x}$ =14.61) while those with low education had ($\bar{x}$ =12.99). Similarly, participants' gender had a significant effect on their knowledge of EE ($F_{(1,153)}$=2.940;p<0.05). Male participants obtained a higher mean score ($\bar{x}$ =13.93) than their female counterparts ($\bar{x}$ =13.75).

The participatory non-formal environmental education programme is effective in impacting adult learners' environmental knowledge, attitude and practices. It is, therefore, recommended that a participatory non-formal environmental education programme be adopted by environmental educators in the teaching of non-formal adult learners.

Key Words: Non-formal education, Participatory instruction, Environmental education, Environmental knowledge, Adult learners.

Word Count: 450.

ACKNOWLEGEMENTS

All glory, honour and adoration be to my Lord Jesus Christ, God Almighty and God the Holy Spirit for giving me the enablement, inspiration, strength, zeal, good health, wisdom, insight, direction, journey mercies, guidance and protection through the period of this research work.

My profound gratitude goes to my supervisors, Dr. Alice M. Olagunju and Dr. J. O. Ajiboye, for their patience, scholarly guidance, direction, advice and for being there for me all through this study. I am grateful to Professor M. Ogunsanya for his unreserved contributions to this work.

I also use this medium to appreciate those who, in their unique ways, contributed in giving me a sense of direction in my chosen career. The first on the list is Professor A. Mansaray, the Vice Chancellor, University of Sierra Leone, who made the field of Social Studies more meaningful to me, and kindled my interest in Environmental Education. The next is Professor Mkpa A. Mkpa, the immediate past Vice Chancellor, Abia State University, Uturu (ABSU), who while serving as the pioneer Director, Centre for Primary and Non-formal Education of the University, introduced me to the innovative Active-Learner-Participation teaching/learning approaches particularly for the non-formal adults.

I am indebted to my highly esteemed lecturers in the Department of Teacher Education University of Ibadan particularly Prof F.A. Adesoji, the current Head of the Department, Prof Oluremi A. Ayodele-Bamisaiye, Professor C. O. O. Kolawole, current Dean, Faculty of Education, Dr. I. O. Osokoya, Dr. F. O. Ezeokoli, Dr. A. Abimbade, Dr. Temisan Ige, Dr. Ayotola Aremu, Dr. Esther Odolowu, Dr. T. O. Iregbu, Dr. I. N. Ohia and Dr. M. K. Akinsola, immediate past Sub-Dean Postgraduate School. I also thank Mr. I. A. Salami for his assistance,

Mr. Israel Olasunkanmi as well as Mrs. F. M. Oladejo, former secretary to the Head of the Department and Mr. Akpan.

I am very thankful to Dr. S. O. Ajitoni and Dr. P. A. Amosun, lecturers in my Unit, the Social Sciences Unit, for their timely assistance. I am very grateful to Dr. B. O. Ogunleye for his scholarly contributions to this work. May the Lord bless him.

I also express my gratitude to Professors Nwadiuto Onofeghara, Nnenna T. Kanno, (Msgr) P. K. Uchenna as well as Professor O. Igbokwe, the current Dean, Faculty of Education, ABSU for their understanding. Dr. Stella Agu is always there to assist and guide. She is my current Head, Department of Education Foundations, ABSU. Others are Dr. Eziaku Ukoha for her care, Professor V. Nwachukwu, Professor R. Eze as well as Professor K. A. Mezieobi who played the dual role of being my first Head of Unit and Head of Department as an academic staff in ABSU. I am grateful to him for his positive impact on my academic career.

I am very gratefull to Professor and Mrs. A. Babalola who made me part of their family. They have been very accommodating, encouraging, kind and friendly. I am also grateful to my sister in-law, Mrs. Judith Amoke Nkire, who, for her concern for my comfort while on the programme, introduced me to this wonderful family.

My most profound gratitude goes to the Nkire family. My elder brothers are the best anyone can have. Barrister Theo Nkire is the mentor to all of us. This work is his dream accomplished. I thank him for his fatherly attention. Also, to Mr. Chima Nkire for catching me young and for laying the foundation of my interest in academics; Chief Sam Nkire, my 'land-lord' for many years 'in whom there is no guile', his wife Mrs Fidelia Nkire, my elder sister, Mrs. Anna Ahuama and her husband Mr Emmanuel Ahuama, my nieces Chinyere and her husband, Imo O. Imo, Nene and her husband, Eddie Okeke. Our parents, Apostle and

Mrs. Marcus Uzoha Nkire of loving memory, invested all they had for the good upbringing of their children. Their love, care, understanding, and expectations helped in guiding my focus while in school.

I also thank the very helpful and encouraging younger generation of the family, Emeka who bought the laptop for this work, Ozichi, Queennett, Chidiebere, Chioma, Ndubusi, Eziaha, Buzo, Glory, and Big Acho, who are ever ready to assist in any way necessary.

I thank Mrs. Deborah Adewale, Idris and Ridwan for helping out with the typing; and Tayo for producing the final draft of the work.

CERTIFICATION

I certify that this work was carried out by Flora Obiageri NKIRE in the Department of Teacher Education, University of Ibadan, Ibadan.

……	……..
SUPERVISOR	**CO- SUPERVISOR**
Dr. Alice M. Olagunju	Dr. J. O. Ajiboye
Ph. D, M.Ed (Ibadan), B.Sc Ed (Ife)	Ph. D, M.Ed, B. Ed (Ibadan)

DEDICATION

I dedicate this work to God, the Almighty, Lord Jesus Christ and God the Holy Spirit, whose Mercy, Grace and Help brought me this far.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVATIONS

AANFE - Agency for Adult Non-formal Education

CESE - Centre for Environmental and Science Education

CONFINTEA(V) -Fifth International Conference on Adult Education

DESD - Decade of Education for Sustainable Development (2005 – 2015)

EAE - Environmental Adult Education

EAQ - Environmental Attitude Questionnaire

EE - Environmental Education

EEM - Environmental Education Module

EKT - Environmental Knowledge Test

EPQ - Environmental Practice Questionnaire

ESD - Education for Sustainable Development

FEPA - Federal Environmental Education Agency

FME - Federal Ministry of Environment

IEEP - International Environmental Education Programme

IUCN - International Union for Conservation of Nature and Natural Resource

NAAEE - North American Association for Environmental Education

NCF - Nigerian Conservation Foundation

NDES-Niger-Delta Environmental Survey

NEETF - National Environmental Education and Training Foundations

NERDC - Nigerian Educational and Research Development Council

NEST - Nigerian Environmental Study/Action Team

NIED - National Institute for Educational Development

SD - Sustainable Development

STAN - Science Teachers Association of Nigeria

UNCED - United Nations Conference on Environment and Development

UNCSD - United Nations Commission on Sustainable Development

UNDESD - United Nation Decade for Education for Sustainable Development

UNEP - United Nations Environment Programme

UNESCO - United Nations Educational Scientific and Cultural Organization

WCED - World Commission for Environment and Development

WCS - World Conservation Strategy

WSSD - World Summit on Sustainable Development

WWF - World Wide life Funds for Nature

LIST OF APPENDICES

CHAPTER ONE

INTRODUCTION

1.1 Background to the Problem

The environment is the basis for all life forms. Its components, land (lithosphere), water (hydrosphere), air (atmosphere), plants, animals and micro-organisms (biosphere) constitute all that make life worthwhile and meaningful for human beings in the society. In recent times, however, there have been widespread reports and real life experiences on the enormous abuse and degradation of these valued resources in virtually all parts of the world. This is to the extent that environmental degradation has become a phenomenon of global concern which calls for urgent intervention. Indeed, scholars agree that the earth's climate is changing due to human activities that release greenhouse gases into the atmosphere (UN Foundations, 2008). From the account of a renowned Nigerian environmental activist, Jibunoh (2008), our planet is dying because we have taken so much from it and have given nothing in return.

This is evidenced by the various unsustainable developmental activities undertaken by people around the globe. In most developing countries, including Nigeria, there have been accelerated incidences of deforestation, soil erosion, flood, desertification, pollution and poor waste disposal and management. On the other hand, the exhaustion of certain natural resources and various types of pollution from the crisis

of modern production system in the highly industrialized countries constitute major threats to the quality of the environment. Consequently, the air we breathe in is being overloaded with Carbon IV oxide and other poisonous effluents from vehicles, industries and power plants. The water we need for domestic uses have been rendered unsafe by a variety of chemical substances. The land is stripped bare of its vegetation or polluted with oil spills and human wastes. The rising sea levels resulting from global warming cause serious threat to people living in island countries and coastal areas. The ozone-depleting substances such as products with chloroflorocarbons, halous and methyl bromides from which plastics and foams are made, allow excessive levels of harmful ultraviolet rays to reach the earth. This has resulted in increased rates of skin cancer, eye damage and weak immune systems in people. There is also a high rate of waste generation apparently due to the accelerated rate of population increase (Olagunju, 1998).

In a concise articulation of the state of the world environment, the World Wild Funds for Nature (WWF), one of the world's largest environmental organisations, made reference to what its scholars term, the "Humankind's Five Worst Environmental Blunders of all Times" or "Man's Five Worst Environmental Own Goals". These are wasting water, over-fishing, toxics and pollution, Invasive species and global warming. As further revealed by WWF (2008), part of the consequences of these environmental blunders include the fact that the ten warmest years globally since 1859 have occurred in the last fifteen years with years 1998 and 2005 jointly as the warmest in record. The year 1998 was not just the hottest in the millennium, it was the first in which more people fled disasters (earthquakes, volatile volcanic eruptions or human-made through

deforestation) than war. Drought, floods, deforestation and poor agricultural practices have so far driven some 25 million environmental refugees off the land, accounting for 58% of the total refugee population worldwide.

It was also noted that the atmospheric level of Carbon IV Oxide (CO_2) is now higher than at any time in the past 420,000 years, and that except an effective protection policies are quickly introduced, its emission will continue to rise thus making it very impossible for humanity to correct the damages caused. Of all the CO_2 emitted by the western industrialized nations, 97% comes from burning of coal, oil and gas for energy and through this process, approximately 25 billion tones of CO_2 (about 800 tones per second) is spewed into the atmosphere annually. This is seriously disrupting the natural balance of the world. One of the main problems with CO_2, as the report revealed, is that it can take about 100 years for it to disperse. Therefore, even if its emissions are stopped immediately, the effects of the harm already done would still influence our weather for some years to come.

Furthermore, WWF recorded that the global production of human-made chemicals rose from one million tons in 1930 to 400 million by the year 2000. The amount of pesticides sprayed on crops has increased by 269 times in 50 years. The impacts of these are enormous and widespread. Their significant benefits notwithstanding, pesticides have long term damaging effects, not only on wildlife but also on human beings. The rising sea levels are threatening to wash away entire nations on low lying islands in the Pacific and Indian oceans. The projection is that global warming will cause sea levels to rise by as much as 5mm per year over the next 100

years if uncontrolled. The overheated world is creating a big change in climatic conditions and this can harm the delicate ecosystem in which the species live.

Some of the most intense climate change–related habitat alterations are those that affect glaciers and ice–fields. Glaciers are retreating at an unprecedented rate to change the entire ecology of mountain habitats while conservation managers are powerless to prevent this loss and have to stand by as the ecology transforms before their eyes. Global warming has contributed to the extinction of wild animals. The golden toad (Bufo periglenes) and the harlequin frog of Costa Rica have disappeared as a direct result of global warming. Back home, Africa is at the risk of losing its Central African glaciers which are the highest permanent sources of water to the Nile River (WWF, 2008).

Since the beginning of the millennium, natural disasters tend to have become part of the world's daily experiences. This alone accounts for the destruction of millions of lives and properties worth billions of dollars. Table 1.1 outlines some of the major natural disasters that have caused havoc of high magnitudes in the different parts of the world in the recent times.

Table 1.1 Major Natural Disasters in Resent Time in the Different Parts of the World

Year	Date	Country/continent	Type	Death toll	Estimated economic impact $	Magnitude
2003	a)	Europe	Heat wave	35,000		-
	b) 26 Dec.	Iran	Bam Earthquake	31,000-43,000		7.3
204	26 Dec.	Asia – India Ocean	Earthquake under water - tsunami	275,000	7 billion donations	9.3
2005	a) Aug.	USA – Katrina	Florida Atlantic	1,836	90.1 billion	-
	b) 8 Oct.	Asia – Pakistan Kashmir	Hurricane Mississippi Earthquake	80,000 3 million-homeless	Above 4.5 billion aid	7.9
	c) 1 Oct.	Guatemala, El-Salvador S/Eastern Mexico etc.	Stan Hurricane	1,598	4.3 billon	
2008	a) 3 May	Burmen Mynaman	Cyclone Natgis	146,000	10.1 billion	-
	b) 12 May	China-Great Skhuan	Great Sichuan Earthquake	70,000 17,921 missing bodies	146.5 billion	7.9
2009		Flu – Globally	Swine flu	11,800	-	-
2010	a) Jan 12	Haiti	Earthquake	230,000 3 million affected 300,000 injured	43 billion	7.0 -
	b) July 26	Pakistan	Flood	1/5 land underwater 2 million affected 2,000 dead		

Source: Wikipedia, the free Encyclopedia 2010

Although Nigeria is not currently on the list of countries where natural disasters have rendered lives virtually impossible, experts have warned that the country is gradually being consigned desolation and barrenness by sustained and unmitigated pollution of her water, air, land and indiscriminate destruction of plants and animals (Uzokwe, 2003). A British geologist, in a more recent remark, has also predicted that the country could be hit by major natural disasters like earthquakes and tsunamis if some drastic

measures are not urgently adopted (Teseun, 2010). This is evidenced in the recent earth tremor in parts of Benue State and incidences of flood disasters in different parts of the country including Sokoto, Kebbi, Jigawa, Kebbi, Jigawa, Kogi, Lagos, Ogun, Oyo and the Niger Delta region (Nigerian Television Authority (NTA), 2010). It is also a major source of worry that there has not been an improvment on the deplorable state of Nigerian environment since the Nigerian Environmental Study/Action Team (NEST) published a profile of the state of the nation's environment in 1991. In that report, NEST reveals that:

(i) soil and coastal erosion adversely affect over 80 percent of the land of Nigeria; Africa's largest single erosion complex exists here;

(ii) the major pollutants in the country are solid wastes, oxygen-demanding wastes, disease agents, sediments, plant nutrients, organic chemicals, fertilizers, industrial affluents, and petroleum products;

(iii) loss of vegetation has led to desertification, soil erosion, declining soil productivity and loss of farmland, flooding and siltation of water bodies;

(iv) farming, logging, grazing, hunting, exploitation of a variety of products, urbanization, all heightened by burgeoning human and livestock populations, have reduced our plant cover to a patchwork of farmlands, plantations and secondary vegetation at various stages of re-growth and maturity; and

(v) poverty is the major cause and the consequence of environmental degradation.

In a subsequent report by Nwokeabia (2008) further reveal that there is hardly any part of Nigeria where gully erosion does not occur. This phenomenon leads to loss of lives and farmlands as well as displacement of populations, as people whose houses and other properties cave into the gullies are forced to relocate at various parts of the

country. Noticeable examples include Agulu-Nanka in Anambra state where, in the past 20 years, over 1500 hectares of land have been lost to erosion. Also, Anucha in Imo State, Auchi in Edo State, Bukuru in Plateau State, Ogbomoso in Oyo State among others also had their shares.

Over 50 million out of the estimated 150 million total population of the country is reported to reside in areas at the risk of soil degradation due to erosion while over 25 million tonnes of the soil is lost to various forms of erosion annually. Furthermore, coastal erosion has washed away the southern coastline of this country and about 400km of the national coastlines are degraded and lost annually at the rate of 50% by tidal erosion and flood (Federal Ministry of Environment, Housing and Urban Development, 2008).

Deforestation has been estimated to be occurring at 3.5% per annum and the areas under forest have declined from 14.9million hectares to 10.1million hectares. As Nwokeabia (2008) revealed between 350,000 hectares and 400,000 hectares of forest is lost annually to logging, collection of poles, fuel wood, provision of site for agriculture, creation of pasture for livestock, breeding, development of dams for agriculture, urbanization and settlement, creation of right of ways for infrastructures (roads/railway, telecommunication, water/sewer, electricity transmission lines etc). Moreover, 80% of Nigerians are rural dwellers, and depend on cutting of woods for fuel. This has contributed to serious forest resources depletion and environmental degradation. Clearing of land for food production alone accounts for over 80% of total annual deforestation (Nwaokeabia, 2008).

The 2008 first edition of the Weekend File, a Network Programme of the Nigerian Television Authority (NTA) reported that, the North-Western States of Kebbi, Sokoto, Zamfara and Jigawa were seriously threatened by desert encroachment as an aftermath of insufficient rainfall and deforestation. These ironically fail victim to flood disasters of high magnitude in the year 2010. In most parts of the Niger–Delta coastal regions of Rivers, Cross River, Akwa Ibom, Bayelsa, Edo and Delta states, some communities have practically been washed away by flood and coastal erosion and the people are presently living on water. This is not unconnected to an earlier findings published by the Niger-Delta Environmental Survey (NDES), which had reported the major environmental problems in the area to include flood and coastal erosion, sedimentation and siltation, degradation and depletion of water as well as coastal resources, land degradation, air pollution, biodiversity depletion, noise pollution, light problems, lack of community participation, health problems, low agricultural production, socio-economic problems such as unemployment and poverty, weak or lack of laws and regulations, and non-improvement in the well-being of the population.

On the South Eastern region, the NTA report further asserted that all the states in the region are erosion prone. Anambra state which is among the most affected by gully erosion within the region is reported to have about 80 active erosion sights spread across the state. Of its 177 communities, there is none that is not affected one way or the other by erosion (Stober, 2008). Abia state has been described as the worst hit with environmental degradation problems in Nigeria by the Federal Minister of Environment who visited the state to obtain first hand information on the stories of woes told about its deplorable environmental condition (Broadcasting Corporation of Abia, 2006).

About 500 erosion sites have been identified in the state and many of the communities are seriously affected by flood, landslide and gully erosion. More than ten communities with a combined population of over 20,000 citizens have been cut off from the rest of the state by gully erosion since 1998 (Olori, 2002). Without much improvement yet, this still makes it impossible for the indigenes to transport their farm produce to the cities. Olori (2002) also reported that in Amaiyi, a village of less than 10,000 people, bones of the dead, long laid to rest have been swept to the surface of the earth by the devastating perennial erosion which ravaged the community.

In the South Western zone, flood from the over-flown river banks like those of the Lagos Bar – Beach are threatening to claim the entire metropolis. In other parts of the Western region is the historic Ogunpa flood disaster in Ibadan 1980. The Ekeremu flood was reported to have lasted more than five months in 2007, instead of its usual maximum period of three months before receding (Stolber, 2008). With the mild earth tremor that rocked Ibadan, Ijebu-Ode, Shagamu (three cities in the Western region) in the 1980s and its reoccurrence in Ijebu-Ode in September 2009, researchers in the National Space Research and Development Agency have officially warned about the possibility of an earthquake in the region if necessary actions are not taken.

Oyo State is strategically located in the South Western zone of Nigeria. With 33 Local Government Areas (LGA) and a population of about 3,847,500, it is the third largest in the country and the second in the South West. It shares boundaries with Kwara state to the North, Osun to the South and partly Ogun state and partly Benin Republic to the West (Odunaike, Laoye, Alausa, Ijeoma & Adeleja, 2006). However, the state's teaming population, high rate of urbanization, poor urban plan, acute

shortage of potable water supply, poor disposal and management of solid and liquid wastes, deforestation and of course incessant flood disasters have plunged it into serious environmental problems. Its capital city, Ibadan, though the largest in Africa, was once referred to by the United Nations as the dirtiest in the country (Aborode, 2010). Because of its fast growing population, Ibadan is noted for its problems of poor refuse disposal and management habits. This has resulted in the blocking of the few existing drainage systems. Consequently the city's major rivers, namely, Kudeti and Ogunpa and the other smaller ones such as Ogbere, Orogun and Labelabe streams are noted for overflowing their banks.

Historically, flood disaster is not a new phenomenon in Oyo State particularly, its ancient capital city of Ibadan which houses twelve out of the thirty-three LGAs. In Tomori's (2010) account, flood disasters in the area back to 1902. And between that year and August 31st, 1980 when the most devastating Ogunpa disaster occurred there had been six cases of flooding recorded; namely:

(i) 1902 – First flooding of Oranyan swamp;

(ii) 1924 – Ogunpa overflowed its banks;

(iii) 1956 – Ogunpa flood which rendered many homeless

(iv) 1960 – Ogunpa flood disaster - destroyed 400 houses;

(v) 1963 – Ogunpa river overflowed its banks again causing disaster to many homes;

(vi) 1978 – Ogunpa river destroyed properties worth several millions of Naira at Old Gbagi market, Ogunpa Oyo, Omitowoju and Molete .

(vii) 1980 - Another Ogunpa flood disaster; the most devastating ever in the history of Ibadan. It killed about three hundred people and destroyed properties worth millions of Naira then.

Since this ugly incident, environmental degradation menace of varying magnitude has continually devastated lives and properties of citizens in the state. According to Bamidele (2011), the Friday, August 26, 2011 flood disaster in Ibadan that claimed over 100 lives and ruined property worth billions of naira, was not the first of such calamitous occurrence in the Oyo State capital. NEMA has also warned that another one may be eminent if urgent precautions are not taken.

Though there are no adequately articulated data on the level of economic and human losses from the effects of environmental disasters in Nigeria there are evidences that virtually all the thirty six states of the country including Abuja, the Federal Capital Territory (FCT), is being ravaged by one or more forms of degradation problems. Table 1.2 presents some data on notable environmental disasters in some states in the six geo-political zones of Nigeria.

Table 1.2 Notable Environmental Disasters in some States of Nigeria

STATE	DATE	LGA/TOWN	TYPE	LEVEL OF DIVERTATION	ECONOMIC ESTIMATED IMPACT
Oyo (a)	31st August, 1980	Ibadan	Flood	- over 2000 affected - 50,000 displaced	-
(b)	1948, 1963, 1978, 1980, 1985, 1987 & 1990	Ibadan	Ogunpa Flood	- 500 houses demolished, properties destroyed & bridges collapsed	
(c)	26th August, 2011	Apete, Eleyele, Ona-ara, Ologuneru, olomi, odo-ona.	Flood	-	
Lagos (a)	October 2010	Ajegunle, Ikorudu, River View Estate, Isale Shomolu	Flood	1000 people displaced	- ₦700, million from Federal Government (FG) to complement efforts of - NEMA and State Government.
(b)	11th July 2011	Agege etc.	Flood	60 dead 683 people displaced	-
(c)	October 2000 Early 1970's till date		Flood Flood	60 dead Over 300,000 affected	-
Ogun		Isheri Okofin	Flood	-	-
Ondo (a)	April 2001	-	Rainstorm	– 800 affected	-
(b)	April 2001		Rainstorm	– 800people affected – Houses, schools, animals & farmland affected	
Osun (a)	April 2001	-	Rainstorm	– 1,700 affected Houses and schools destroyed –	-
(b)	April 2001		Rainstorm	– 1,700 people affected – Houses & schools destroyed	

Ekiti	April 2001		Flood & Rainstorm	– Public Schools & 890 houses destroyed	
Anambra			Erosion	– 460 erosion sides	– ₦200 billion required
Abia (a)			Erosion	– 500 erosion sides – No villages cut off from the rest of the state	-
(b)	July 2001		Rainstorm	– 500 houses	
Enugu			Erosion	– 317 erosion site for urgent intervention	-
Imo	April 2001		Rain & Windstorm	– Over 10,000 people displaced – 100 houses, 150 electric poles & 40,000 oil palm destroyed	
Akwa-Ibom	March 2001		Flood and Rainstorm	– 400 peoples – 750 houses washed away – Farmlands destroyed	
Bayelsa	1999 & March 2001	-	Flood	2/3 of the population houses, schools, markets and farmlands submerged	-
Delta (a)	March/April 2001		-	– Half of population	
(b)	1999, March/April 2001		Flood & Rainstorm	– Houses, schools, markets & farmland submerged	
Delta	2000	Warri	Pipeline Explosion	– 250 dead	-
Edo (a)	2002	Okpela	Oil spill	– 20,000 inhabitants affected	-
(b)	March 2001		Flood and Rainstorm	– 560 houses destroyed	
Niger-Delta Region	Jan-Oct, 2000		Pile line explosion	– 800 cases of pipeline vandalization.	-
Jigawa	1988, March, April & August 2001		Flood & Windstorm	– 35,500 displaced in 1988; 450,150 displaced in	

				2001 – Houses farmlands & animals destroyed	
Jigawa	2010		Flood	– 2 million out of 4 million whose of the state affected – Half the total farm land washed away	- FG: ₦700 million - Other: ₦150
Kebbi				– 30 villages and towns affected	- FG N750
Kano			Flood	-	– ₦25 million
Kano	1988, 2001		Flood & Windstorm	– 300,000 people displaced in 1988 – 20,445 people in 2001	
Zamfara	July 2001		Flood	– 12,398 affected – Building submerged, farmlands destroyed, properties damaged	
Adamawa	April 2001		Flood	– 500 peoples, houses and farmlands destroyed	
Bauchi	August 1988		Flood	– 750 houses washed away, – Farmlands destroyed	
Borno	August 1988, June/July 2001		Flood	– Houses and farmlands destroyed	
Taraba	August 2005		Flood	– More than 50,000 displaced – 80 house totally swept off. 410 houses extensively destroyed	
Yobe	April & September, 2001		Flood, Fire & Drought	– 100,000 affected – Houses & farmlands submerged, houses razed, animals affected	
Plateau		Bassa LGA Mongo		-	-
Niger (a)	1999, 2000		-	– 200,000 affected – 200,000 people	

(b)	1999 & 2000		Flood & Rainstorm	– displaced – Houses, schools, animals and farmland affcted	
Kogi	March , May 2001		Flood & Rainstorm	– 1,500 people displaced – Houses, schools & farmland destroyed	

(NTA Network News, 2010; Adebimpe, 2011 Etuonovbe, 2011)

These environmental problems have been attributed to people's lack of environmental awareness, inadequate environmental knowledge, lack of the necessary skills to identify, prevent and solve environmental problems, lack of evaluative measures for accessing the effects of human actions ahead of time, negative environmental attitude and unsustainable environmental practices among others (UNESCO, 1990; WWF, 2008). Relatively, each of these may also be influenced by such demographic factors as age, gender, socio-economic status, education level, academic field and area of specialization of individuals.

WWF (2008) linked the root causes of environmental degradation to lack of awareness, information and skills necessary for making wise decision for sustainable use of the natural resources. Mansaray and Ajiboye (1998) and Ahove (1999) asserted that illiteracy and its attendant poverty are major causes of environmental degradation in Africa and other developing countries. In the same vein, Noibi (1993) noted that people's lack of awareness of the implications of their actions resulting from poor environmental literacy and knowledge has been identified a major contributor to environmental degradation in Nigeria. Other studies reporting low environmental knowledge of Nigerians include Mansaray, Ajiboye and Audu, (1997) Olagunju, (1998)

and Ajitoni (2005). Low environmental knowledge has also been reported of adults in the non-formal setting (Mansaray, Ajiboye & Audu (1998); Dokun (1999); Nzewi (2001) and Eguabor (2001).

Another important factor that affects the environment is people's attitude to the environment. Attitude is noted to be usually influenced by what one values. As such one's attitude affects how he/she relates to other people and to the environment in general and so constitutes a major influence on our prospect for achieving a sustainable future. Incidentally, virtually all the studies on environmental knowledge also examined the environmental attitude of the same target population and, in most cases, reported a corresponding poor attitude of the subjects under study towards environment-related issues (Mansaray & Ajiboye, 1997; Olagunju, 1998; Mansaray, Ajiboye & Audu, 1998; Eguabor, 2001; Nzewi, 2001; Ogunleye, 2002).

The actual environmental practices of the people are necessary factors towards the attainment of a clean and healthy environment. Noibi (1993), citing the earliest studies that reported strong positive correlation between knowledge and attitude (Eyes, 1976; Etchiam, 1978; Noibi, 1982), concluded that one's level of ignorance of the environment determined the extent of harm (practice) which he would do to the environment. Generally, daily experiences in Nigeria reveal very poor environmental practices. The rural dwellers who are predominantly peasant farmers, fishers, hunters, petty traders and cattle rears are still engaged in their practice of indiscriminate bush–burning, over-grazing, over-cropping, over-fishing and pollution of water bodies, cutting down of bushes and trees for hunting thereby causing extinction of some plant and animal species. In the urban centres, there is an alarming rate of poor waste

generation and disposal by families, sellers of various items in the market places and corporate bodies as well as ineffective waste management system and legislation by the government. All these may rightly be attributed to Noibi's (1993) earlier submission that ignorance or lack of environmental awareness of the right action to take is the greatest single contributor to environmental degradation problems. That there are still a dearth of literature on studies with significant level of improved environmental knowledge, attitude and practices of Nigerians is an indication that a lot still needs to be done to empower the people for more environmental friendly habits and sustainable use of environmental resources.

In their efforts towards seeking a lasting solution to the rapidly depleting environment, scholars recommended education as a major tool. As Cunningham and Cunningham (2002) rightly stated, it is only an environmentally educated person that can understand scientific concepts and facts that underlie environmental issues, the interrelationship that shapes nature as well as appreciate how human society is influencing the environment. It is also only an environmentally educated person that can explore his/her values in relation to environmental issues, decide whether to keep or change those values and become involved in the activities that improve, maintain and restore natural resources and environmental quality for all. As noted by Wisconsin Department of Educational Interactions (1994), the rapidly growing and complex environmental problems, calls, more than ever, for world problem–solvers. Educators have globally accepted this role of preparing people to become critical thinkers, informed decision makers and able communicators. As such, nations of the world have made and are still making frantic efforts at developing programmes in Environmental

Education. In this direction, Nigeria has joined other nations in the pursuit of ways to develop effective environmental education programmes. It has been involved in series of bilateral and multilateral agreement with many environmentally concerned agencies including the World Bank, World Health Organization (WHO), UNESCO, IUCN, FAO, UNDP, UNEP among others (Petters, 1993). These agencies pledge both cash and kind assistance towards the control and combating of the countries' peculiar environmental problems.

As part of its efforts to adhere to the declarations, charters and decisions of major global meetings on environmental education, the Federal Government directed the Nigerian Educational Research and Development Council (NERDC) to plan and develop an Environmental Education Programme for schools. The project statement, among other things includes, to assist government to build institutional capacity and make operational its education and environment policies of achieving an environmentally literate citizenry, empowered sufficiently to deal with current environmental issues such as sustainable development. In 1998, NERDC produced curriculum documents on EE for the Junior and Senior Secondary Schools of the formal education sector (Okeke, 2004). Notably, the World Wide Funds for Nature United Kingdom and Nigerian Conservation Foundation's (WWF-UK/NCF) contribution in integrating environmental awareness and education programme in schools marked a unique point in the history of EE in Nigeria. They played a major role in the production of the existing curriculum for the different educational levels. EE courses are currently being run at the NCE level at the Delta State College of Education, Adeniran Ogunsanya College of Education Lagos as well as at the undergraduate and

postgraduate levels of the tertiary institutions in the University of Calabar, Lagos State University, University of Benin among others (Imhonlele, 2007).

Inspite of these efforts, the incidence of environmental degradation problem is still on the increase in Nigeria. Although it could be noted that considerable amount of work is currently going on in the formal EE sector, nothing much seems to be happening in the non-formal angle (Okeke, 2004), that can impact positively on the environmental knowledge, attitude and practices of Nigerians who are not presently pursuing formal education. However this is not peculiar to Nigeria. In the report of USAID on the assessment of the existing EE efforts in five African countries – Gambia, Guinea, Madagascar, Namibia and Uganda, it was revealed that EE programmes were not available for the out-of-school learners (USAID, 1999). In non-African countries like Jamaica, it was also reported that there has been inadequate attention to community-based educational processes oriented to adults, which focus on engaging people in an on-going learning process and developing their capacity to participate in decision-making and action. As such, important audience like the workers, consumers, householders, industries, and recreation and leisure groups appear to be inadequately targeted.

In Australia, the government launched a National Action Plan-2000 which explicitly recognizes that EE is not confined to formal schooling but occurs in a wide range of non-formal education settings. At the state level, the New South Wales (NSW) EE plan 2002-2005 advocates, "energizing the community to act responsibly". In a study carried out by Guavera, Flowers and Griffits (2006), however, it was reported that there was a dearth of literature specifically on the sector of non-formal EE. They

therefore asserted that this is not unconnected with the misleading idea held by some people that "adults are set in their ways, as such, there is no point trying to change their behaviours", thus, justifying the decision to concentrate on educating children in schools. In a counter argument, Slattery (2000) had earlier affirmed that adults as a matter of fact are more likely than children to be significant players in communities, groups and locality. He further noted that the adults are able to "enthuse and organize" and possess the necessary awareness upon which to base political action and to influence and educate others. Hence, there is the need for environmental educators to support the adults to active, critical and creative EE engagements (Clover, 1998). The UNESCO's (2002) report presented at the World Summit on Sustainable Development in Johannesburg noted that the major reason for focusing on adult education for sustainable development is that it would be unwise to wait for the present generation of school and college students to grow up and begin applying what they are learning. It is today's adults who are the primary voters, consumers, workers, teachers, scientists and parents.

The emphasis on non-formal adult EE is not just a recent event. In the Tbilisi 1977 UNESCO conference on EE, the significance of non-formal EE was stressed as "something the formal education often ignores". In Chapter 36 of Agenda 21 of Rio de Janeiro 1992 UNCED Conference, the caption, "Promoting Education, Public Awareness and Training", was stressed to encompass all streams of education, formal and non-formal. The Thessaloniki Declaration, 1997, specifically stressed that education towards sustainability involves all levels of formal, non-formal and informal education in all countries (Knapp, 2000). In the same vein, during the Fifth International

Conference on Adult Education (CONFINTEA V), in which participants ratified the Hamburg Declaration on Adult Learning, it was stated that education for environmental sustainability should be a life-long learning process. Adult EE can therefore play an important role in sensitizing and mobilizing communities and decision-makers towards sustained environmental action.

Following these efforts, UNESCO in 2001 launched the first phase of a pilot project to empower rural communities towards environmental sustainable practices in India, Maldives and Nepal using participatory action research to help rural communities to monitor their own environment as well as identify and address the environmental issues that are degrading their quality of life. Similarly, some other countries like the Latin America and the Caribbean did not have the patience to wait until the younger generation presently in schools would grow up to begin to deal with their peculiar environmental problems. They allocate huge resources to adult non-formal EE (Medina, 1989). In Poland, Iraq, Senegal, Indonesia, and Wales, non-formal EE is a well known programme to the people (Young & McElhone, 1986).

In Nigeria however, most efforts in the area of non-formal EE tend to begin and end on creating environmental awareness. Most discussions, press releases and briefing by high ranking stakeholders on the environment have always emphasized the use of radio and TV jingles, panel discussions, essay writings, documentaries and award presentations (FME, 2000; FEPA, 1995) which are basically non-participatory. Hardly would anyone emphasize organized educational activities which otherwise are participatory in approach for the large percentage of the country's population outside the formal school system. In Petter's (1995) categorization, these include the:

- farmers – who burn bushes and cut down trees indiscriminately.
- fishermen – who catch fishes anyhow and sometimes pour chemicals into the rivers.
- women in general especially those in the rural areas – who use mostly wood to make fire for their daily cooking. They cut down trees in order to get firewood. Also, when they use the fire to cook, the environment is polluted with smoke - indoor pollutants.
- drivers – who do not service their vehicles regularly and so pollute the air with exhaust fumes.
- oil companies – which contribute to the abuse of the environment through their waste products and oil spillage into bodies of water and land.
- cattle/goat/sheep rearers, – who take their animals to various areas for feeding and cause over-grazing.

Others include the professionals, highly educated citizens, government functionaries (Petters, 1993) and children under eighteen who are not presently in schools (Olagunju, 2002).

Although the non-participatory programmes may have played roles in creating some level of awareness, the need for their augmentation with the Participatory Non-formal EE programmes that are more structured, educative and interactive has been emphasized (Young & McElhone, 1986). This, as Young and McElhone (1986), further asserted, is important for countries in which environmental issues are immediate and relevant to their day-to-day lives and where the formal education system is often disadvantaged by lack of resources coupled with high drop-out rates, as in the case of Nigeria. According to Disinger and Monroe (1994), EE is more than a presentation of

information. It is rather intended to help learners to achieve environmental literacy which has attitude and behaviour components in addition to knowledge components. Thus the goal of EE is to instill in learners (both in the formal and non-formal settings) knowledge about the environment, positive attitudes towards the environment, competency in citizens action skills and a sense of empowerment. In the articulation of the Nigerian Environmental profile by NEST (1991) it was concluded that there is need to educate people especially at grassroot levels to be aware of their responsibility for nurturing and wisely utilizing the environment and taking steps towards restoring balance where such has been upset.

Part of the premise on which the Non-formal EE is established emphasizes that majority of the world's population is still being educated outside the formal school system. If one adds the goal of life-long education, much of the burden of EE fall on the out-of-school or the non-formal education programmes. With reference to EE therefore, much learning occurs in the non-formal settings (EETAP, 1998). In this direction, the NEST document recommended that future directions on EE should accord priority to educating those outside the formal school system. If non-formal EE is properly articulated, it has the tendency of reaching this larger percentage of the society and encuring high percentage coverage. Aghoolor (1993) observed that the large number and various groups of learners involved in the non-formal sector makes it pertinent that EE at this level should be taken more seriously because its success means the success in conserving the environment.

Furthermore because those involved are adults of different categories who know what their needs/problems in relation to the environment are, they act as the needs arise

which gives them the opportunity to be more practical than in the formal sector. Students in the formal school system strictly follow the outlined syllabus. In most cases they may be studying other aspects of the environment while their immediate surrounding may be overtaken by another form of environmental problem but they cannot deviate from the syllabus to utilize the unique opportunity to study the problem and practically proffer the solutions (Aghoolor, 1993).

In the present state of the Nigerian environmental condition where EE has not yet had any meaningful influence on the citizenry, any worthwhile strategy for arresting or mitigating the fast rate of environmental deterioration should aim at developing positive environmental attitude and actions among people. It should also seek to stimulate people's awareness about their behavioural patterns and how best to get involved through training programmes that goes beyond theory but incorporates practical activities (Nzewi, 1998). Gbamanja (1998) expressed a similar view that, in teaching EE, the role of the teacher is not that of purveyor of information for rote learning and subsequent regurgitation. He rather advocated that the content should be exciting and dynamic where every learner seeks to find his or her own information that will be beneficial for solving the problem at hand. This implies that there is the important task on the part of the teacher and the curricular experts to articulate EE programmes that centre on the basic learning needs of the learners and how they may learn best.

There have been a few other programmes established by the Federal Government over the years in the bid to improve the standard of the environment. Some of them include the monthly Environmental Sanitation Exercise, War Against

Indiscipline (WAI), tree-planting exercise, establishment of National Parks and Forest Reserves, organization of workshops, seminars and conservation clubs. There have also been those specifically focused on women like the Better Life Programme for Rural Women and its successor, the Family Support Programme. According to Madumere (2000), as much as these dedicated efforts are to be commended, the truth is that the "Earth Watch" commitment of our country seems to be just tagging along with the rest of the world. Experiences reveal that most of those programmes died without achieving a minimal success for various reasons ranging from poor coordination, inability to target the right audience, inadequate funding, poor implementation strategies, and failure to follow laid down rules for programme development among others. Madumere (2000) therefore noted that effective management of our environmental problems can be achieved through initiation of programmes that emphasize teaching/learning approaches that will reach out and involve different classes of people in activities which encourage community participation. This has the potential of consolidating the chances of success and as well as deal with lack of political will and understanding on the part of policy makers which disrupt and kill programmes.

As Kola-Onasanya (2000) noted, EE programmes should aim at improving the quality of the environment and the development of the understanding of the influences which restrict or modify it by raising the quality of information (knowledge), improve the capacity for acting responsibly (practice) and by heightening aesthetic awareness (attitude). Moreover, the improvement of the environmental knowledge, attitude and practices of the people tend to be central to the six major categories of objectives of EE as cited in the UNESCO – UNEP International EE Programme (1989). The present

study therefore centred on the development and implementation of a participatory non-formal EE programme for the adult learners as a way of augmenting the existing non-participatory approaches to non-formal EE and also to provide a more innovative approach to effectively impact their environmental knowledge, attitude and practices which is attainable through active learner participation teaching / learning process.

The participatory model can be applied at two levels. Beside the participatory approach to researching into environmental issues, there is also the participatory approach to offering EE to learners (Mansaray, 1999). The two basic approaches to offering non-formal EE as recommended by UNESCO are namely the Participatory EE programmes and the Non-participatory programmes (Young & MacElhone, 1989). Based on the assumption that the world can be transformed sustainably and that all the people have both the knowledge and the power to bring about the transformation, GreenHeart Education (2008) viewed participatory approach to learning in three perspectives namely: Participatory learning in the sense of 'Deliberative Rituals' which help learners to voice out and acknowledge concern and new commitment to the environment. Secondly, the Participatory Action Research (PAR) which involves learning by researching and the result of this kind of activity is living knowledge that can be translated into action. The third approach is the 'Dialogue Form', which is generally undertaken in discussions. It is also referred to as the Methodology Heart of Adult Education. This is based on the assumption that all adult learners came with life experiences and personal perceptions that must be harnessed. It is on the basis of this third perspective that the present Participatory Non-formal EE Programme was developed as it tends to be appropriate for adult learners targeted for the study.

The programme was developed in line with the Guidelines for the Development of Non-formal EE as published by the North American Association for Environmental Education (NAAEE, 2004). The Non-formal EE Programme: Guidelines for Excellency comprises of recommendations for developing and administering high quality Non-formal EE programmes. The step-by-step guide to the flow of the programme development is presented as follows:

- Needs assessment
- Assessment of organizational needs and capacities.
- Determination of the programme scope and structure.
- Programme delivery resources.
- Programme quality and appropriateness.
- Evaluation

The development of the programme is further posited on the Technological model of programme development which emphasizes that the current issue is on people's capacity to create a culture, society and technology that can free them and also keep them caring and belonging (Brunner, 1974). The step by step facets of the technological model tend to cut across the other major existing curriculum models. These are:

1. Contextual Analysis: A process through which the programme developer obtains background information such as the needs, problems and aspirations of the potential users of the programme in relation to environmental issues.

2. Aims and objectives Formulation: These were formulated to mirror the needs, problems and aspirations of learners as identified at the contextual analysis phase.
3. Prototype Construction Phase: This involves the selection and organization of the relevant content, learning experiences, instructional materials and evaluation instruments which are relevant and suitable for learner characteristics.
4. Programme Interpretation/Implementation: This involves subjecting the draft of the prototype curriculum to the scrutiny of experts in the field of Education, EE, Non-formal EE as well as the colleagues of the programme developer for their input in terms of relevance of the programme to the target learners, instructional steps, appropriateness of time allocation, appropriateness of activities, instructional materials and evaluation instruments. It also involves a try-out phase in which the draft was field-tested using a limited sample to detect the discrepancies where necessary.
5. Programme Recycling/Revision: This is the phase where the necessary adjustments/ modifications were made to reflect the corrections on the dictated discrepancies as well as the observations made at monitoring and assessment phase.
6. Programme installation: Following a successful EE programme revision, a large scale implementation otherwise referred to as installation will then be carried out.

. The implementation of the programme was based on the social constructivist instructional theory which posits that knowledge is constructed when individuals

engage socially in talk and activity about shared problems or tasks (Wikipedia foundations, 2008). In this case, the teacher's role shifts from that of one who imparts knowledge to that of a facilitator.

Everyday experiences reveals that people's environmental knowledge, attitude and practices may also be influenced by such demographic factors as gender, age, education level, years of working experience, residence, area of specialty among others. This study however considered education level and gender as more critical towards environmental outcomes. This is due to the fact that they constitute issues which still stand unresolved particularly with reference to environmental degradation.

With the high level of illiteracy in Nigeria, the tendency has been to blame the problems of environmental degradation on the poor and the uneducated masses (Ajiboye & Ajitoni, 2008). Petters (1995) however, asserted that Nigerians of high education levels are major contributors to the nation's environmental degradation problems like gully erosion threatening the highways and requiring huge sums of money to control, poor drainage system resulting in flood, deforestation, hazardous pollutants, oil spillage as well as damming of the rivers without proper watershed management. He further noted that some of these professionals, in their various fields as contractors, bid to win contracts, to construct roads, bridges, build industries, office and business complexes, estates, and quarters without adequate Environmental Impact Assessment (EIA). Some still indulge in importing harmful chemicals into the country. There is also the "War on Nigeria's Wetland" story as told by WWF (1999) which has to do with the craze among the very rich and educated Nigerians to live at the

waterfronts in Lagos which provoked an unprecedented land reclamation project along the coastal areas.

Gender also constitutes a serious issue in environmental degradation in recent times. Women have been variously described as worse hit and worst victims of environmental hazards (Petters, 1993); as bearers of environmental blunt, and custodians of micro-environments (Warren, 1991); as those with strong capacity to influence others including children, husband and other members of the family (Anyakoha, 1999); and as environmental managers (Anyakoha, 1999; Nzewi, 2001). It has also been noted that women interact extensively with the environment as users of environmental resources such as food, fuel, water, and also as consumers of the products and services that originate from the environment as well as producers too. However, Dike (2001) contended that women are also among the initiators of efforts that result in environmental degradation problems. She further highlighted some of the ways by which women contribute to environmental degradation to include: deforestation, poor agricultural practices, improper waste disposal, and rapid population growth through uncontrolled child bearing practices. Despite the women's close level of interaction with the environment, studies exclusively targeting women reveal low environmental knowledge and attitude (Eguabor, 2001; Dokun, 1999) as precursors to their unfriendly environmental practices.

1.2 Statement of the Problem

The Nigerian environment is currently associated with various problems including erosion, pollution, flood, and health hazards resulting from various kinds of human activities, particularly deforestation, oil spillage, domestic and industrial wastes, dumping of toxic wastes, over-fishing, over-grazing and over-cultivation of farmlands.

The manifestation of these problems has been accentuated by mass poverty among the citizenry. Scholars have attributed these growing trends to widespread ignorance about the importance of environmental resources in their natural forms and people's lack of awareness of the implications of their actions resulting from poor environmental literacy and knowledge. Most of the previous attempts at impacting peoples' environmental knowledge, attitude and practices were however directed at schools and students, while the peripheral efforts at the non-formal sector have been basically non-participatory in approach. Since those who are outside the formal school system form the larger percentage of the people who degrade the environment most, they need to be at the fore-front in turning the environment around for the better. It becomes imperative therefore that non-formal adult EE programmes which are participatory in approach be properly focused to position the adults for better environmental knowledge, attitude and practices. This study, therefore, explored the impact of a Participatory Non-formal Environmental Education programme on the adult learners' knowledge, attitude and Practices (KAP). It also investigated the moderating effects of education level and gender on the dependent variables.

1.3 Hypotheses

Seven null hypotheses were tested in this study at .05 level of significance. These are:

$H0_1$ There is no significant main effect of the Participatory Non-formal Instructional Programme on the Adult Learners' Environmental:

(a) knowledge

(b) attitude

(c) practices

$H0_2$ There is no significant main effect of education level on the Non-formal Adult Learners' Environmental:

(a) knowledge

(b) attitude

(c) practices.

$H0_3$ There is no significant main effect of gender on the Non-formal Adult Learners' Environmental:

(a) knowledge

(b) attitude

(c) practices

$H0_4$ There is no significant interaction effect of the Participatory Non-formal EE Instructional Programme and education level on the adult learners' environmental:

(a) knowledge

(b) attitude

(c) practices.

$H0_5$ There is no significant interaction effect of the Participatory Non-formal Instructional Programme and gender on adult learners' environmental:

(a) knowledge

(b) attitude

(c) practices.

$H0_6$ There is no interaction effect of education level and gender on the Non-formal Adult Learners' environmental:

(a) knowledge

(b) attitude

(c) practices.

$H0_7$ There is no significant interaction effect of the Participatory Non-formal EE Programme, education level and gender on the Adult Learners' Environmental:

(a) knowledge

(b) attitude

(c) practices.

1.4 Significance of the Study

The findings of this study could provide a basis on which to educate adult learners on how to act sustainably in the environment. It could also provide the basis for ascertaining the non-formal adult learners' environmental knowledge, attitude and practices. This is due to the fact that the validated instruments for this work would be of great use in measuring adult learners' environmental knowledge, attitude and practices in the Nigerian context.

The participatory Non-formal instructional programme developed and implemented in the study would provide the non-formal adult educators with the necessary participatory approach to teaching EE which serves as a compliment to other non-formal EE approaches which are basically non-participatory in nature.

The findings of the study would provide non-formal adult EE curriculum developers with empirical data on the role of educational level and gender of adult learners on their acquisition of environmental knowledge, attitude and practices as well as provide them with a sample of appropriate programmes that could be adopted in the planning and development of non-formal EE especially for adult learners.

The study could also serve as a guide to the government to formulate policies that would engage non-formal adults in practical active participatory learning processes. The study would as well sensitize the ministry of education to implement non-formal EE programmes that are active learner participation oriented.

The findings of the study would provide the researchers in the field of EE the basis for further research.

1.5 Scope of the Study

The study covered four class levels (JS 1, 2, 3, and SS 1) in each of the two Adult Literacy Centres in Oyo State where secondary school education is currently being offered. The study is targeted at adult learners who are presently in the Junior and Senior Secondary classes for the following reasons:

- Being a study that focused on the Non-formal Adult Environmental Education, it required an audience outside the formal school system.

- Since the language for the delivery of the instructional programme was the Nigerian lingua-franca, that is, the English Language, it was, therefore, necessary that an audience of reasonable level of literacy attainment, as may be represented in the Adult learners presently in the secondary school class levels be selected for the study.

The Environmental topics/concepts that were examined include:

- Meaning of environment
- Human factors that affect the environment
- Natural environment
- Importance of the different parts of the environment.
- Ways the different parts of the environment depend on each other (Ecosystem)
- Human activities (Development).
- Effects of human activities on the different parts of the natural environment.
- Environmental friendly habits (Sustainable Development).

The rationale for the selection of these concepts was based on UNESCO's recommendations that the contents of any meaningful EE programme must be:

- selected in an order that begins with providing the learners with the awareness of their immediate environment.
- And progress in an order that would help foster the learners' innate curiosity and enthusiasm, providing them with continuing opportunities to explore their environment, so that as they engage in direct discovery of the world around them, they would also develop analytical action skills.

- And organized in a way that allows them to make their own decisions and think more critically on their choices, so that as they learn in the process that what they do individually and in groups can make a difference in their environment they would develop a sense of empowerment and a sense of personal responsibility.
- In this order virtually all that were necessary to equip adult learners in both the high and low education levels, males and their female counterparts for responsible environmental knowledge, attitude and practices was hereby packaged in a more simplified manner.

1.6 Operational Definition of Terms

Adult learners: Learners in the Adult Non-formal literacy centres who are currently undergoing classes equivalent to the Junior and Senior secondary schools of the formal education system

Conventional lecture method: This is a situation in which the teacher dominates all the teaching learning processes including introduction of concepts, discussion of facts or ideas on the concept, giving notes, questioning and assignments

Education Level: This refers to one's present academic attainment.

Environmental Attitude: Adult Learners' level of favourable or unfavourable disposition towards the concept of environment, its related resources, human activities and sustainable development.

Environmental Knowledge: This refers to the Adult Learners' level of acquired information, facts and ideas about the concept of environment, its related resources, human activities and sustainable development.

Environmental Practices: This refers to the extent of involvement of the Adult Learners in undertaking environmental friendly actions towards the environment and its related resources.

High Education Level: This comprises of the learners in the JSS 3 and SSS 1 in the Adult Literacy Centers.

Impact: Measurable effect of an intervention

Low Education Level: This comprises of learners in the JSS 1 and 2 in the Adult Literacy Centers.

Non-formal EE Programme: This includes both the participatory and non-participatory EE programmes specifically targeting the audience outside the formal education sector

Non-participatory Non-formal EE Programme: This refers to the Non-formal EE progrmmes whose target audience are merely passive recipients as in radio and TV broadcasts, press briefings and articles, visits to institutions such as museums, zoos, acquaria and occasional listening to lectures.

Participatory Non-formal EE Programme: This refers to the Non-formal EE programme which utilizes a structured, educative and active learner participation teaching/learning processes in educating the varying groups of people outside the formal school system.

Participatory Instruction: A learner-centred, activity-based teaching/learning approach.

CHAPTER TWO

REVIEW OF LITERATURE

The review of the literature is organized under two main headings namely theoretical and empirical literature:

2.1 Theoretical Framework

2.2 Environmental Education (EE)

2.3 Education for Sustainable Development (ESD)

2.4 Adult Environmental Education

2.5 Participatory Non-formal Adult Instructional guide

2.6 Empirical Literature

2.7 Participatory Non-formal EE Programme and adult learners environmental knowledge.

2.8 Participatory Non-formal EE Programme and adult learners' environmental attitude.

2.9 Participatory Non-formal EE Programme and adult learners' environmental practices.

2.10 Education level and environmental knowledge, attitude and practices.

2.11 Gender and environmental knowledge, attitude and practices

2.12 Appraisal of Literature

2.1 Theoretical Framework

The development of the present Non-formal adult EE programme is posited on the technological model of curriculum design. Its major proponent is J.S. Brunner. In the 1960s, he emphasized the structure of knowledge in the disciplines (Brunner, 1960; 1966) but revised it by the 1970s to suggest greater emphasis on the context of the problems facing the society. He further asserts that the issue is currently on people's capacity to create a culture, society and technology that can free them and also keep them caring and belonging. As Inyang – Abia (1994) rightly noted, nothing else than the environment provides a context of problems that face human beings and the issue of their capability to create culture, society and technology that is both wholesome and sustaining. In Brunner's (1974) technological model, greater emphasis is led on the relevance of the curriculum to the situational problems as they challenge the society in their various versions. Others whose views support the technological model include UNESCO (1975), Rownfree (1974), and Romiszowski (1988). The step by step facets of the technological model as presented below tend to cut across the major existing curriculum models. These are:

1. Contextual Analysis Phase
2. Aims and objectives formulation phase
3. Prototype construction phase
4. Programme interpretation/implementation phase
5. Recycling/revision phase
6. Programme installation phase

In line with the tenets of technological curriculum model which emphasizes active learner participation in teaching/learning processes, the developed participatory non-formal EE instructional guide is based on the social constructivist instructional theory which posits that knowledge is constructed when individuals engage socially in talk and activity about shared problems or tasks (Wikipedia Foundations, 2008). In this case, the teacher's role shifts from one who imparts knowledge to being a facilitator. Its major proponent includes J.S. Brunner and Jean Piaget. The ultimate aim of the theory is the construction of shared understanding through authentic and meaningful activity. This aim is informed by the following assumptions that

- learning is constructed by the learner
- learning occurs within and is influenced by context (learning or meaning does not occur in isolation but is influenced by one's social context)
- teaching supports learning construction.

Hence, constructivism is often associated with pedagogical approaches that promote active learner participation by doing. Unlike the previous education viewpoint, where the responsibility rested on the teacher to teach and where the learner played a passive receptive role, constructivism values facilitator-supported learning that is initiated and directed by the learner.

Jean Piaget, in seeking an answer to the perennial philosophical question "how do we come to know what we know" concluded that knowledge cannot be transferred intact from one person to another. People must construct their own knowledge (Cobern, 1993). Generally, in using constructivist instructional theories, the following activities are involved:

- The learners are to formulate their own ideas about the nature of the concepts presented e.g. concept of environment.
- They need to investigate the processes involved in solving problems on the concepts, and come to their own understanding of the nature of those concepts and their importance.
- They also construct their understandings of each of those concepts in ways that make sense to them.
- Also, learners in the class may come from a wide background of prior experiences with the concepts (environment etc.). Some may have studied the concepts at the primary schools, secondary schools, higher institutions or elsewhere. Learners are therefore to be divided into groups because of the wide range of prior experience (Olusunde, 2008).

This theory is very vital for EE programmes, particularly, as it has the tendency to provide corresponding responses to groups and individuals who have criticized EE for lacking credibility and accuracy. For instance, Sanera (1996), one of such critiques once asserted that "learners are being scared by the misinformation presented by their teachers and textbooks". Other related statements as noted by Athman and Monroe (2000) have described EE as resulting in a "we're all going to die" sense of hopelessness. Some others are of the view that, "these days facts frequently take a back seat in the EE". And that "too often EE instructions seem to aim … at convincing learners that the planet earth is in immient danger and they must save it" (Menzier, 1997). In a report published in reaction to these and other related misconceptions, the characteristics of EE were outlined to include:

- factual accuracy – a situation where materials should reflect sound theories and well-documented facts.
- Balanced presentation of differing viewpoints and theories – differences of opinions and explanations should be presented in a balanced way.
- Openness to inquiry – where materials and learning environments should encourage the learner to explore different perspectives and form their own opinion (NEETF, 1997).

These tend to be in line with the views of Jean Piaget who as an early supporter of constructivism, believed strongly that learning occurs as a result of interactions between individuals and physical and social environments. As such instead of transmitting knowledge from the teacher and books to the learner, it is rather actively constructed from the learner's actions in the environment (Wisconsin, 1994). Hence the view that development of knowledge is a process of continual construction and reorganization

(Yager, 1991).

Another key tenet of constructivism upheld by this study is the interplay between newly constructed knowledge and the learner's prior knowledge. According to Ausubel et al (1978), the most important factor influencing learning is what the learner already knows. Thus Athman and Monroe (2000) acknowledge that learning can occur only when the new idea or concept can be integrated into the learner's conceptual system. The context of learning therefore is important as the situation must be somewhat familiar and somewhat new. They further assert that constructivism implies that instructional methods need to be consistent with how students construct knowledge

and that the content or context must be relevant. This also is expressed in Mkpa's (2003) three basic ways learners can learn best which include that learners learn best when:

- they are actively involved in their own learning;
- learning goes from known to unknown; simple to complex and
- the fact that learners do not learn at the same time and rate are well considered from the onset

in every teaching/learning processes.

These have implications for EE programmes that are learner-centered and involve active participation of learners. In this view, EE is what learners do and not what is done to the learners (Athman & Monroe, 2000).

In summary constructivist theory upholds that;

- rather than knowledge being transmitted directly from the teacher or textbooks to the learner, it is actively constructed by learner's action in the environment. Thus emphasizing learner active participation in learning.
- there is an interplay between newly constructed knowledge and the learner's prior knowledge. As such, the most important factor influencing learning is what the learner already knows;
- the three-stage process of teaching for conceptual knowledge include:
    1) preparation phase - when learners begin to think about the phenomena that will be explained in the unit, and discuss their own explanations.
    2) presentation phase - in which the teacher may explain key principles and theories

3) application and integration phase - during which the learner applies and integrates the new phenomena into his personal knowledge.

- Constructivism closely parallels experiential learning where learning is an active process, occurring when experiences build upon previous experiences in a positive way and incorporates interaction between the learners and the environment (Anderson, 1984). This also has a strong implication for EE where EE is considered as what learners do and not something that is done to the learners.
- Cooperative learning in which learners are allowed to work in small groups to explore new ideas, gather information, discuss ideas, apply concepts and solve problems (Monroe, 1999) is of great importance.
- McCarthy's multiple learning styles and Gardner's theory of multiple intelligence remind educators that not all learners learn and respond to learning situations in the same way and at the same rate. That intelligence is not a fixed or a static reality, it can be learned, taught and developed.

It is based on the premise on which constructivist theory is founded that this study sets out to determine the impact of the developed Participatory Non-formal EE Instructional Programme on the Adult learners.

The inevitability of this approach in the teaching and learning processes of Non-formal EE is best described by the Chinese adage and conclusion on education practices (MKpa, 2003; NTI, 2006), a statement also accredited to Confucius, as his description of how human mind approaches learning process (Lakshmi & Hee, 2005):

"I hear; and I forget
I see; and I remember
I do; and I understand"

It was also in the same vein that Kindle in NTI (2006) reported that people generally remember:

> "10% of what they read
> 20% of what they hear
> 30% of what they see
> 50% of what they hear and see
> 70% of what they say
> 90% of what they say as they do a thing.

In this interactive approach to teaching and learning, the following steps are involved:

1. The teacher\facilitator organizes learners into groups and set the time for the commencement and completion of the lesson, provides instructions, revises previous lesson, interacts with the learners individually or in their groups, and releases tasks or responsibilities to the learners.
2. Learners are to work together in their various groups to maximize their own and each other's learning (Johnson & Johnson, 1999).
3. Learners to make suggestions or attempt explanations of the concepts (e.g. group presentation to the whole class).
4. Learners are made to play with the explanations or ideas (repetition) e.g. whole class input/discussion.
5. The teacher\facilitator provides situations in which learners might be encouraged to note discrepancies in the concepts presented, where necessary (e.g. summary, appreciation, motivation etc.).
6. Learners to apply and consolidate their conclusions (evaluation).

In a similar programme developed and used by the Department for International Development (DFID) of the United Kingdom (UK) in retraining teachers in three Local Government Areas in Nigeria. The steps were represented by Mkpa (2003) as follows:

- Organizing learners into small groups by teacher (facilitator)
- Group activities by learners in the individual groups
- Group presentation to the whole class by members of the individual groups on group-by-group basis
- Whole class inputs/discussions
- Summary by facilitator and learners
- Evaluation by facilitator and learners

The retraining programme for the teachers which was in a Non-formal Education setting was aimed at equipping the practicing teachers who incidentally are adults also, with skills in active-learner participation teaching/learning processes.

The present Non-formal Adult EE programme was developed in line with the guidelines for the development of Non-formal EE Programmes (NFEEP) as published by the North American Association for Environmental Education (NAAEE, 2004). The guideline was conceived in response to the results of research findings over the years that EE has failed to create an environmentally literate and concerned public working towards a sustainable future (Arcury and Johnson, 1987; Bowyer, 1990; Brody, 1996; Giglioti, 1990; Iozzi, 1989; Thomson and Giateriger, 1985). According to Mordock and Krasny (2001) Development of Non-formal EE Programmes: Guidelines for Excellence, provides answers to the critics who have accused EE of losing its original emphasis on interdisciplinary and wholistic education geared towards action and

change; and to the others who argue that EE promotes action without critical thinking. Its overall aim is to facilitate a superior educational process that leads to the environmental quality people will desire (NAAEE, 1994). The guideline comprises six basic features which are presented in the guide to the flow of the development of NFEEP in figure 2.1

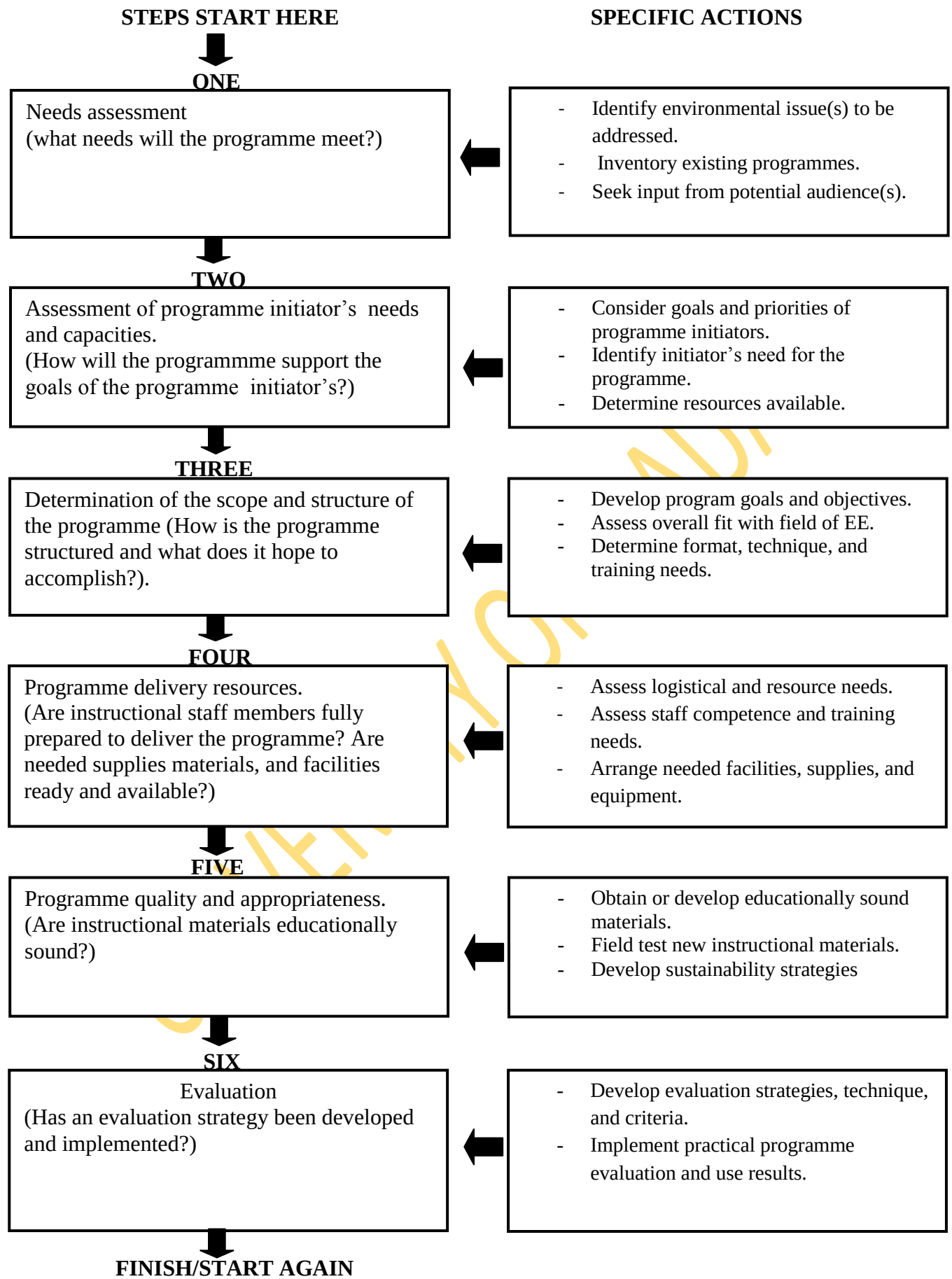

Figure 2.1: A Step-by-Step Guide to the Flow of the Development of NFEEP
(Source: North American Association for Envronmental Education, 2004).

2.2 Environmental Education

Environment means the sum total of all the external conditions which may influence the life of an individual organisms or population (Inyang-Abia and Omoren 1994; & Ikwuazom 1997). However, Inyang-Abia and Omoren (1994) who also asserted that environment denotes immediate surroundings have in a more elaborate discourse, described environment as the whole set of natural and social systems in which people and other organisms live and from which they draw their sustenance. They further categorized the environment into two namely:

-the natural environment and

-the social environment

The natural environment constitutes of all the living and non-living objects including the land, water, air and the biosphere (the sphere housing the life forms) while the social environment consists of all the human creation. Okpara (1995) made a slightly different categorization of the environment. He defined environment as the combination of natural objects (living and non-living), human-made objects, the interrelationships between them and various circumstances which surround people on earth. According to him, the components of the environment may be grouped into physical and non physical components. He further grouped the physical components into:

-the natural living things

-human – made features.

The physical components are made up of the natural non-living things including the land, or the solid portion of the earth. The natural living things include the plants, human beings, animals and the micro-organisms. The human-made features include the

human settlements, and all the associated infrastructures, such as roads, foot paths, farms, buildings, dams etc. While the non-physical components comprise of all the social, economic, cultural educational, religious, health, legal institutions, relationships and conditions surroundings one's existence.

From the foregoing, it is obvious that human beings constitute a dominant factor in whichever way the concept of environment may be perceived. Obviously, the components of the environment support human survival in many ways. Our existence on earth is closely tied to the availability of land, water and air, and they obtain various types of resources from plants, animals and the rich cultural environment.

In relation to this perception, Sauve (1992) presented six conceptions of the environment which at different points in history influenced education thoughts. These are:

- Environment as nature
- Environment as a Resource
- Environment as a problem
- Environment as a place to live
- Environment as the Biosphere
- Environment as a community project

- **Environment as Nature**

This could be traced to the Nature Study Movement of the 19th century when John Muir and Enos Mills had a study of the natural history of plants. The major emphasis of this conception is that environment is nature in its original, pure form and

as such deserves to be appreciated, respected and preserved by human beings in order to have an enriched quality of being.

- **Environment as a Resource**

This, no doubt, falls under the conservation Education Movement which rose in response to the soil erosion, dust storms and flood disasters of the 1930s. (Desinger 1993). The main trust of this is that the environment is considered as a life sustaining resource which by its nature is equally limited, threatened by both artificial and natural forces and therefore deserves to be conserved and protected from deteriorating and wasting away. This would ensure adequate resources for the present and the future generations. The conception of environment as a resource to be conserved is in consonant with the goals and principles of Sustainable Development of the current era.

- **Environment as a problem**

This was conceived in relation to the life-support system otherwise known as the biophysical environment, which is threatened by pollution and degradation generated from the accelerated industrialization and urbanization, which, as such, is in need of solution. This formed the basis for the development of educational strategies that help to develop problem solving skills in learners. This also encouraged and widened the scope of education to include the out-door or out-of-school education which came in response to the growing concern that urban youths were not experiencing direct contact with the natural environment.

- **Environment as a place to live**

With the understanding that our day-to-day living at work, at home, in the neighbourhood and at play revolves round the environment in which we live we

therefore, owe the duty to learn and to know about the environment in order to plan for and take care of it for our use and the use of the future generation.

- **Environment as the biosphere**

This conception perceives environment as a world of interdependence between human beings and the other things which calls for solidarity among all peoples and as such formed the root for the Global Education Movement or the Earth Education Movement which culminated in the World Earth Day of 1970.

- **Environment as a community project**

Here, environment is perceived as a community project in which everyone is expected to be involved to achieve its effective and successful execution. It envisages a shared living place between humans and other objects, political concern and the focus of critical analysis of related issues. This therefore calls for solidarity, democracy and personal and collective involvement in order to participate in the evolution and sustenance of the community for the present and future generation.

It was perhaps in this progression that the two previously dissociated terms – 'Environment' and 'Education' came to be merged to form a concept which according to Filho and Palmer (1992) engendered an interest and mode of thought and practice that has since led to the growth of a global movement. Disinger (1983) asserts that the term Environmental Education (EE) was first used in 1948 by Thomas Pritchard at the International Union for Conservation of Nature and Natural Resources (IUCN) at Paris. While in Wheeler's (1995) view, its first use was in passing by Paul and Percival Goodness in their book 'Communiters' published in 1947. Whichever way, it may be

important to note that EE was in the midst of major environmental challenges as a veritable tool for a lasting solution.

Environmental deterioration which has grown to their present state of near uncontrollable stage dates back to the 1890's when a Swedish Chemist, Svante Arrhertus alerted the people around that burning fossil fuel and clearing standing forests for various developmental purposes had released an unusual amount of Carbon IV oxide into the atmosphere resulting in the increased warming of the climate (Cunningham & Cunningham, 2002). Nobody then bothered much about that. It was not until the later part of the 1960s when similar discoveries of varying degrees had began to make head ways that remarkable attempts at remediating the situation began to be recorded. Part of such attempts included series of meetings, conferences, conventions, protocols, seminars and workshops at the international, regional and national levels. Notable among them may include:

- 1965 conference held in Keele University England marked the first recorded use of the term environmental education in Britain.
- 1968 Biosphere Conference by UNESCO in Paris where world awareness of environmental education was fully evidenced.
- 1970 Nevada Conference of the International Union for Conservation of Nature and Natural Resources.
- 1971 Organization of American States Conference on Education and Environment.
- The Meeting of Panel of Experts on Conservation of the Wetland. (Cunningham & Cunningham, 2002).

These may not have recorded an attendance of international recognition, but they may be event that set the stage for the transition of education about the environment and in the environment to educate for the environment. The subsequent efforts that formed the foundation for the present status of Environmental Education started off with the 1972 Stockholm International Conference on Human Environment; the Belgrade 1975 International workshop on Environmental Education; 1977 Tbilisi Inter-governmental conference on Environmental Education. A profile of some notable international meetings convened as part of the effort to establish effective Environmental Education (EE) system globally is presented in Table 2.1:

Table 2.1: Some Notable International Meetings on Environmental Education

DATE	TITLE	HOST GOVT	HIGHLIGHTS/ ACHIEVEMENTS	ATTENDANTS	ORGANIZERS
1972 5 – 16 June	1st International conference on Human Environment	Stockholm Sweden	- 109 recommendations broadly grouped into five themes - decision to establish the United Nations Environmental Programme (UNEP) headquarters in Nairobi, Kenya. - an environmental fund to assist the financing of environmental projects to which member nations are to contribute voluntarily - Initiation of World Environmental Day (June 5th). - the emergence of the concept of Environmental Education (EE). - establishment of I.E.E. by UNESCO and UNEP - IEE to organize the 1st International workshop on EE at Belgrade.	- 134 NGOs - Representatives from 113 UN member nations.	UNESCO/ UNEP
1975 14-26 October	International Workshop on EE	Belgrade Yugoslavia	- Belgrade charter - Identification of the major goal and five objectives of EE - Belgrade Charter stressed the need for EE to: 1. be a continuous lifelong process, 2. be interdisciplinary in approach 3. consider environment in its totality. 4. emphasize active participation in preventing and solving environmental problems. 5. examine major environmental issues from a world point of		IEEP, UNESCO

			view giving due importance to regional differences and 6. promote the value of local, national and international cooperation in the situation of environmental problems (Holdgate, et al, 1982).		
1977 14 – 26, October	1st Inter-governmental conference on environmental education	Tbilisi Georgia (defunct USSR)	- the Tblisi declaration with two of the recommendations of the conference constitute the framework, principles and guidelines for EE at all levels – local, national, regional and international and for all age groups both inside the formal school system and the Non- formal. - built upon the Belgrade charter - emphasized the importance of EE in the preservation and improvement of world's economy	- delegates from 66 member nations. - 2 non-member states - in all, 265 delegates and 65 representatives and observers attended the conference.	UNESCO and UNEP
1978	International congress of the UNESCO/ UNEP	Mosco, USSR			UNESCO UNEP
1987 14 – 26, October	International congress of the UNESCO/ UNEP	Mosco, USSR	- world commission on environment and development report – 'Our common future' - Tbilisi principles on EE of 1977 and the need for action on the Brundtland report were endorsed.	- Over 300 specalists from 100 countries. - Observers from IUCN	UNESCO UNEP
1990	World Conference on Education for All	Jointen Thailand	- world declaration on Education for All as working tools required to be able to serve and participate fully in development. - to improve the quality of life. - to make informed		UNICEF, UNDP, UNESCO and World Bank.

			decisions - to continue learning.		
1992 17, Oct.	UN Conference (Earth Summit) on Environment and Development	Rio de Janeiro, Brazil	- Rio declaration on environment and Development - agenda 21 – a programme of action for sustainable development - the statement on forest principle	Representatives from 179 countries attended.	UNESCO
1992	World Congress for Education and Communicat-ion on Environment & Development (ECO – ED)	Toronto, Canada	- publication of a curriculum resource guide	- Over 4000 delegates from 84 countries. - 46% of the 740 speakers were women - 40% of the delegates were from the south	North American Association for EE -Council for outdoor Education of United Nation. -UNESCO, - UNEP
1994		Gland, Switzerland	- to evaluate progress in the development of EE strategies in Europe.		UNESCO, IUCN
1995	EE for sustainable development (SD)	Athens, Greece	- need to alter the focus of EE was stressed. - the fact that sustainable development is the ultimate goal of EE was emphasized. - EE to combine issues pertaining to individuals, societies, environment and economy.		UNESCO
1995 Nov.	Educational and Public Awareness for Sustainable Development	Pruthonic (Zech republic)	-determination of the most effective ways of conducting EE activities in order to reach the principles of SD.		UNESCO UN Commission for sustainable development (UNCSD)
1996 April/ May	Fourth (4th) Session of the UN Commission for Sustainable development		- review of the activities involved in raising environmental awareness at national and international levels (Poland, Warsaw, 2001)		UNCSD
1997 8 – 12, Dec.	International Conference on	Thessaloni ca, Greece	- Thessaloniki declaration - an international conference on EE to be	In all 1, 300 participants from 84 countries	UNESCO and the Government of Greece.

	Environment and Society: Education and Public Awareness for Sustainability .		held in 2002 (ten years later)	attended	
2000 April	World Education Forum	Dakar	- education as a fundamental human right. - education as a key to sustainable development		UNESCO
2001 24 – 25 Sept.	Regional ministerial meeting for World Summit on sustainable development	Geneva	- to increase the general understanding on how to implement and promote education for sustainable development in practice.		UNESCO
2002 26th Aug. – 4th Sept..	World Summit on SD (Rio + 10 or Earth summit – 2)	Johannesburg S. Africa	- endorsed the decade for ESD (2005 – 2015) as proposed by the Indian Government (connect 2000). - commission on SD prepared the Agenda 21 implementation plan. - establishment of world solidarity funds for poverty eradication from voluntary nations.	- 104 Heads of states. - 9000 delegates - 8000 NGOs. - 4000 media persons	UNESCO

SOURCE: Report of UNESCO and UNESCO-UNEP International Conferences on EE

Nigeria has been part of most of these international and intergovernmental initiatives aimed at charting a course to bringing a lasting solution to the global environmental degradation problems. She has been signatory to a good number of the international treaties, protocols and conventions stating with the Mineral Oil (safety) Regulations Act of in 1963 (Abong, 1995; FEPA, 1995). No doubt Nigeria's attendance in the first International Conference in 1972 held in Sweden, Stockholm, on Human Environment, ignited in her desire to join the rest of the world in more practical

attempts at combating environmental problems and ensuring sustainable development. By 1975, a division of Urban Development and environment was created within the Federal Ministry of Economic Development. The unit was later moved to the Federal Ministry of Housing, Urban Development and Environment. It was still later placed under the Federal Ministry of Works and Housing, as the Division of Environmental Protection by 1983.

Another major landmark in the Nigerian national steps at environmental protection, conservation and preservation, was the establishment of the Nigerian Conservation Foundation (NCF) an affiliate of WWF, in 1980 (Imhonlele, 2007). With the joint effort of NCF and the Federal Government, the Federal Environmental Protection Agency (FEPA) was established in 1988 under Decree 59 as a swift response to the dumping of five ship loads of toxic wastes of Italian origin in 1988 in small pot town of Koko. Initially created as a parastetal under Federal Ministry of Works and Housing, FEPA was charged with the challenging mandate of construction of physical structures, staff recruitment, capacity building, establishment of standards and regulation, outreach prograsmmes and environmental management and compliance monitoring. Its authority was later strengthened in 1992 when it was moved to the presidency and with an expanded mandate to include the protection of Nigeria's biodiversity and conservation of its natural resources. It is also part of FEPA's mandate on the establishment of Federal Ministry of Environment in 1999 to be absorbed into the new ministry.

There are two forms environmental education; formal and non-formal. The formal EE consists of all the activities and leanings taking place at the different levels of the formal school systems (pre-primary, primary, secondary and tertiary) which are

designed to equip the learner with the proper awareness, knowledge, skills, and attitude that will enable him to make a responsible and sustainable use of the environmental resources. As a new field of knowledge, scholars have proposed various strategies for its introduction into the existing school curriculum. Gyallay – Pap (1997) however, categorized the approaches into three:

i. Infusion
ii. Integration
iii. Separate subject (block approach)

In the infusion approach, environmental topics are inserted into the existing curricula. This involves enriching and expanding existing syllabi and course materials. Through this approach the contents of core subjects remain the same while substances of the examples change. Ideally, infusion results in the incorporation of Environmental Education (an inherently interdisciplinary field) into all aspects of the curriculum at every grade level. Infusion recognizes that environmental issues cut across disciplinary boundaries and that environmental responsibility does not only rely on knowledge, skills, and attitudes that are incorporated, but also go beyond, basic scientific understanding. It is the most widespread approach adopted by countries especially in the primary and post primary levels.

The integration approach breaks down the barriers of the subjects or discipliners. It entails a systematic incorporation of relevant environmental materials into the syllabi. The entire existing curriculum is revised or overhauled to allow for the incorporation of relevant environmental ideas and concepts. This insures a full integration of

environmental contents in the curriculum, making it an integral part of the core subject (Gyallay – Pap, 1994).

While in the separate subject approach, environmental Education is taught as a separate identifiable subject. This approach consists of offering separate and distinct environmental courses. The concern of the proponents of this approach is that EE may be short-changed or ignored unless it received its own place in the curriculum. In their views, the separate subject approach will offer the depth that is missing in the other approaches, as well as offer an identifiable focus for attracting funding, evaluating process, and encouraging career development. This is also referred to as the block approach.

The debate on how to incorporate EE still continues. While some educators would prefer the infusion approach, others would want it to be integrated. Some others still would advocate the separate-subject or any other approach still. None of these approaches should be regarded, out rightly, as the best. They are rather expected to complement each other.

The Non-formal Environmental Education which is the second form of EE refers to any organized, intentional and explicit effort to promote learning and to enhance the quality of life through the non-school settings. Non-formal Environmental Education therefore, encompasses all the organized educational activity about, for and from the environment that takes place outside the formal school system.

It includes programmes and activities of the mass media, community educational institutions and organizations, like community clubs, aquariums and science centers. It is also organized through workshops, seminars and conferences. These may

take place, as the case may be, at the zoos, parks nature centres, community centres, youth camps, offices or even the conferences room/centres. Activities in this sector include:

- community action projects sponsored by both business and non-formal education organization.
- programmes in the local, state and national parks, centres, offices etc.
- wild life refuges.
- TV, Radio and other mass media programmes focusing on environmental issues.

Categorically, Non-formal EE may be classified either as participatory or non-participatory (Young & McElhone, 1986).

It is participatory when the learners are actively involved by physically carrying out varying activities that demonstrate environmental protection, preservation and conservation during the teaching/learning processes. This may include the workshops, seminars, community projects, control or preventive activities against erosion, flood and pollution, like tree planting and sanitation exercises etc.

The non-participatory includes those in which the learners are merely perceive recipients of knowledge as in the cases of:

- TV and Radio broadcasts
- press articles
- visits to institutions such as museums, acquaria etc.
- listening to lectures at local clubs.

The target audience for the Non-formal EE may include:

- the general non specialist public of young people and adults whose daily conducts have a decisive influence on the preservation and improvement of the environment.
- the social groups whose professional activities affect the quality of the environment
- Scientists as well as the technicians.

Others include the community groups, government officials, business, industrial and private citizens. In the same vein, Petters (1995) also articulated the target group for Non-formal EE that may be regarded as peculiar to Nigeria to include the following:

- Market Women-who pollute the environment with a lot of trash, such as leaves, orange peels and rotten good items.
- Farmers – who burn bushes and cut down trees indiscriminately.
- Fishermen – who catch fishes anyhow and sometimes pour chemicals into the rivers.
- Women in general especially those in the rural areas – who use mostly wood to make fire for their daily cooking. They cut down trees in order to get firewood. Also, when they use the fire to cook, the environment is polluted with smoke.
- Drivers – some drivers do not service their vehicles regularly and so pollute the air with exhaust fumes.
- Oil companies – these contribute in the abuse of the environment through their waste products and oil leakage into bodies of water and land.
- Cattle/goat/sheep rearers – who take their animals to various areas for feeding and consequently cause over grazing.
- Women of child-bearing age – having too many children cause over-population which also contributes to the abuse of the environmental resources.

However, Aghoolor 1993 in Olagunju (2002) monograph series on Fundamentals of Environmental Education grouped the Non-formal sector into three namely:

(1) Students outside school hours - Attempts are currently being made to reach the Nigerian primary and Secondary schools through establishment of Green Clubs.

Other conservation club activities by which this group can be reached include quiz, essay and project competitions on EE, drama, debates, symposium and workshops, others are the Young Farmers' Club.

(2) Children under 18 who are not in the school system - These may be reached through the mass media, organization of talks, seminars and workshops on EE.

(3) Adults who are not in school or those who have finished from schools (the general public) may be reached through:

- Environmental sanitation exercise
- Tree-planting parks and reserves e.g. forest and animal reserves
- Organization of workshops
- Using existing associations to project EE e.g. Woman Action Groups – Better Life Programmes
- Nigerian Union of Journalists
- National Union of Road Transport Workers
- Market Women Association
- Farmers' Union
- Non-governmental Organizations
- Publicity through the mass media including radio, television, print media and public campaigns in different local languages. (Olagunju, 2002).

However, the collaboration between formal and non formal E.E is quite common and widespread, from the local nature centres working with school systems to federal agencies working with business organizations and Universities. Such strong links need to be accorded high recognition for the roles they play. For instance, parents" awareness and understanding of environmental issues which they may have acquired non-formally, are frequently enhanced by their children's involvement in the formal school systems. As children become involved in the problem-solving and active

participation in the effective EE they frequently take these issues home and involve their parents in discussing about them. One of the guiding principles of EE states that it should be continuous and life-long which begins from the pre-school level and continuing through all formal and non-formal stages.

From the draft backgrounder for practitioners of EE as produced by Thompson (2002), part of the guiding principles of EE states that EE should cater for all ages. It should be addressed to the general non-specialized public of young people and adults whose daily conducts have decisive influence on the preservation and improvement of the environment as well as particular social groups whose professional activities affect the quality of the environment. And finally, the scientists and technologists whose specialized research and works will lay the foundational knowledge on which education, training and official management of the environment should be based.

The recommendations of the Stockholm conference of 1972, the 1975 Belgrade charter (an internationally accepted blueprint for EE), Tbilisi 1977, as well as the recommendations of some other subsequent UN conferences like the Moscow conference on EE and Training of 1987, the Toronto 1992 World Congress for Education and Communication on Environment and Development 1992, the 1997 Thessalonica Conference on Environment and Society, Education and Public Awareness for Sustainability, Agenda 21 of Rio 1992, Johannesburg 2002 and the others continually reaffirmed that an effective EE must incorporate the environmental dimension into the out-of-school education for the young people and adults in the rural and urban areas, including literacy programmes.

The non-formal EE programmes often complements and enhances formal education. They share the same aims and objectives. They are also guided by the same principles, though they may differ in their timing, content organization, and duration. In Table 2.2 effort is made to summarize how both sectors work differently to achieve their common aims and guiding principles.

TABLE 2.2:Models of the Formal and Non-formal Environmental Education

Formal	**Non-formal**
Long term duration and general in focus.	Short-term duration and specific in focus
Credential-based	Non-credential based
Long circle and undertaken both on full-time and part-time basis	Short-circle, recurrent and undertaken on a part-time basis
Standardized and input-centred in terms of its content	Individualized and output-centred in terms of its content
Academic and official in nature	Practical and democratized
Institution determined entry requirements	Clientele determine entry requirements
Delivery system is institution-based and in most cases isolated from the environment.	Environmental-based and community-related
Its delivery is also rigidly structured and usually teacher-centred	Flexible, learner-centred.

Source: Combs, Prosser and Ahmed (1973)

2.3 Education for Sustainable Development (ESD

Environmental Education (EE) has long been considered a very strategic tool for achieving Sustainable Development (SD). Though EE is closely connected to SD scholars have viewed the relationship from varying perspectives which gave rise to concepts such as:

- Education for Environment and Sustainable Development, which indicates that SD is the ultimate goal of EE.

- Education for Environment and SD, an expression which indicates that SD refers to specific objectives which should be added to those of EE.
- Education about SD, in which case SD becomes the focus of a critical analysis, and
- UNESCO (1997) report at the ECO-ED conference which states that EE is one of the many thematic education that contributes to the overall Education for Sustainable Development (ESD).

Regardless of the way and manner in which EE is related to SD, it should be noted that EE from its inception addressed a wide range of issues and contemporary problems which forces it to interfere with other interrelated educational dimensions. These include peace education, human right education, intercultural education, population education, media education, international development education, community life education (Sauve, 1992). It primarily aims at changing a world currently faced with a myriad of complex environmental decay and deterioration problems to a responsible society full of opportunities not only for the present but also for generations to come. In this context therefore the concept of sustainability underlines such education endeavour in which the survival of the future generation is not compromised.

In Chinaka's (2008) analysis, sustainability connotes ecological soundness, economic viability, social justification, recognition of the fundamental dignity of all human beings, and adaptability not only to the development of new appropriate technologies but also innovations in social and cultural terms. In the same vein the LTP Subproject (2005) further asserts that sustainability in the final analysis is a moral and ethical imperative in which cultural diversity and traditional knowledge need to be

respected. It therefore concludes that the concept of sustainability applies to the environment and all its related issues of population, health, food security, democracy, human rights and peace and many others. In this direction, sustainability ensures that human beings apply considerable level of restraint in their quest to harvest as well as develop the environmental resources for improved livelihood, hence the need for a sustainable approach to development which is currently referred to as Sustainable Development.

The concept of SD emerged in response to the unprecedented environmental degradation caused over several years ago by industrially-based economic development. As agreed by development expects, this type of development is unsustainable. Emphasis on SD has been on since the first ever international conference on Human Environment held in Sweden, Stockholm in 1972. UNESCO's (1997) document noted that SD was the ultimate goal of the Stockholm conference. And that the major focus of the new vision was to defend and to improve the environment for the present and future generations. This incidentally has become an imperative goal for mankind also. The major outcome of the Human Environment conference was its explicit attempt to view development and environmental protection as two sides of the same coin rather than as separate issues.

The issue of SD was further boosted by the establishment of the International Environmental Education Programme (IEEP) in 1975 by UNESCO and UNEP as directed in the Recommendation 96 of the Stockholm conference. The activities of IEEP in the first phase of its first ten years (1975-1977) culminated in UNESCO-UNEP sponsored Tbilisi conference in 1977 during which a fairly comprehensive concept of

EE with regards to its goals, objectives, and models of implementation was drawn (UNESCO-UNEP, 1978).

Part of the achievements of the second phase of the IEEP in its first ten years (1978-1980) was the publication of the "World Conservation Strategy" (WCS) in 1980 by the IUCN, UNEP and WWF which addressed for the first time the conflict between environment, conservation and development. The strategy as observed by Eliot (1994) introduced development as an important means of achieving conservation and that both development and conservation are mutually dependent.

In the third phase (1981-1985) emphasis was on the development of the contents, methods and materials for EE practices and training activities (UNESCO, 1985). With the creation of the World Commission on Environment and Development (WCED) by the UN General Assembly Resolution 38/16/1 in 1983 and other activities of the IEEP most countries realized the need to upgrade their own environmental programmes to deal effectively with environmental problems and officially introduce EE into their educational plans and reforms (UNESCO, 1985). These culminated in the 1987 UNESCO-UNEP Congress on EE and Training held in Moscow with the major objective of providing the member states with the framework for preparing their own national strategies for EE and training for the 1990s (UNESCO-UNEP, 1987).

Though the Moscow congress reflected on series of the activities of the IEEP emphasis thereafter tend to have shifted to the educational activities involved in EE rather than the development of contents and classroom activities in schools which IEEP had promoted in its first ten years. Moreover the publication of "Our Common Future" by the WCED in 1987, "Caring for the Earth" by the IUCN, UNEP, and WWF in 1991

and the subsequent debates and discussions by the international community led to the 1992 Earth Summit in Rio de Janeiro, Brazil.

The 1992 summit captioned UN Conference on Environment and Development (UNCED) was another landmark event in the history of SD. The conference produced among other documents the popular Agenda 21as its major outcomes. Agenda 21 is an Action Plan which provided a comprehensive set of principles to assist governments and other institutions in implementing SD policies and programmes. This then resulted in the creation of the UN Commission on Sustainable Development (UNCSD) in 1993 to ensure that the Agenda 21 is effectively implemented.

Following the general consensus that achieving SD is essentially a process of learning, emphasis on the role of education became a common feature in virtually all the UN conferences of the 1990s including those on human rights in Vietna, 1993; population and development in Cairo, 1994; Small Island developing states in Harbadus, 1994; social development in Copenhagen, 1995; women in Beijin, 1995; food security in Rome, 1996 and human settlement in Instanbul, Turkey, 1996. As Fien (1999) rightly observed, education, has been central to discussions on SD since the Earth Summit in Rio de Janeiro in 1992. Specifically chapter 36 of the Agenda 21 captioned 'Promoting education public awareness and training' emphasizes that education, including formal and non-formal, public awareness and training should be organized as a process by which human beings and societies can reach their fullest potentials. SD aims at improving the capacity of the people to address environment and development issues (United Nations, 1992).

The 1997 Thessaloniki conference produced the Thessalonica declaration in which the role of education and its related issues were highlighted and considered (UNESCO, 1997). The conference as noted by Sato (2006) discussed the concept of education for sustainability along with terms such as education for sustainable living, education for SD and education for a sustainable future. As stated on the 11th on the list of the Thessaloniki declaration, EE, as developed within the framework of the Tbilisi recommendations, addresses the entire range of global issues included in the Agenda 21 and it has also become recognized as education for sustainability. This then allows that EE may also be referred to as education for environment and sustainability (UNESCO, 1997). By this it becomes clear that the roots of Education for Sustainable Development (ESD) are firmly planted in EE.

The relationship between EE and ESD is enshrined in the four main thrusts of ESD as published in chapter 36 of Agenda 21. These include:

1. Promotion of basic education - which caters for the different needs and capabilities of the individual learners and empowers them through active learner participation teaching/learning approaches, to fulfill their expected roles in their immediate environment

2. Reorientation of existing education to address SD - in which case education is expanded to include in more practical terms the development of critical thinking skills, decision-making, acceptable societal values, positive attitude, as well as information gathering, organizing, interpretation and analysis of information which encourage and support commitment and active participation in issues confronting the community.

3. Development of public understanding and awareness - in terms of the rights and responsibilities of learners in order to ensure a sustainable livelihood.

4. Training - The Agenda 21 specifically asserts that the world needs a literate and environmentally aware citizenry and workforce to help guide nations in implementing their sustainability plans. All sectors of education included formal and non-formal education settings such as businesses, industries, government and non-governmental organizations, literacy centres, community organizations are encouraged to be educated in environmental management. (UNDESD, 2005 – 2014).

The relationship is further demonstrated by Sato (2006) in his analysis of the evolving nature of the field of EE as summarized in figure 2.2.

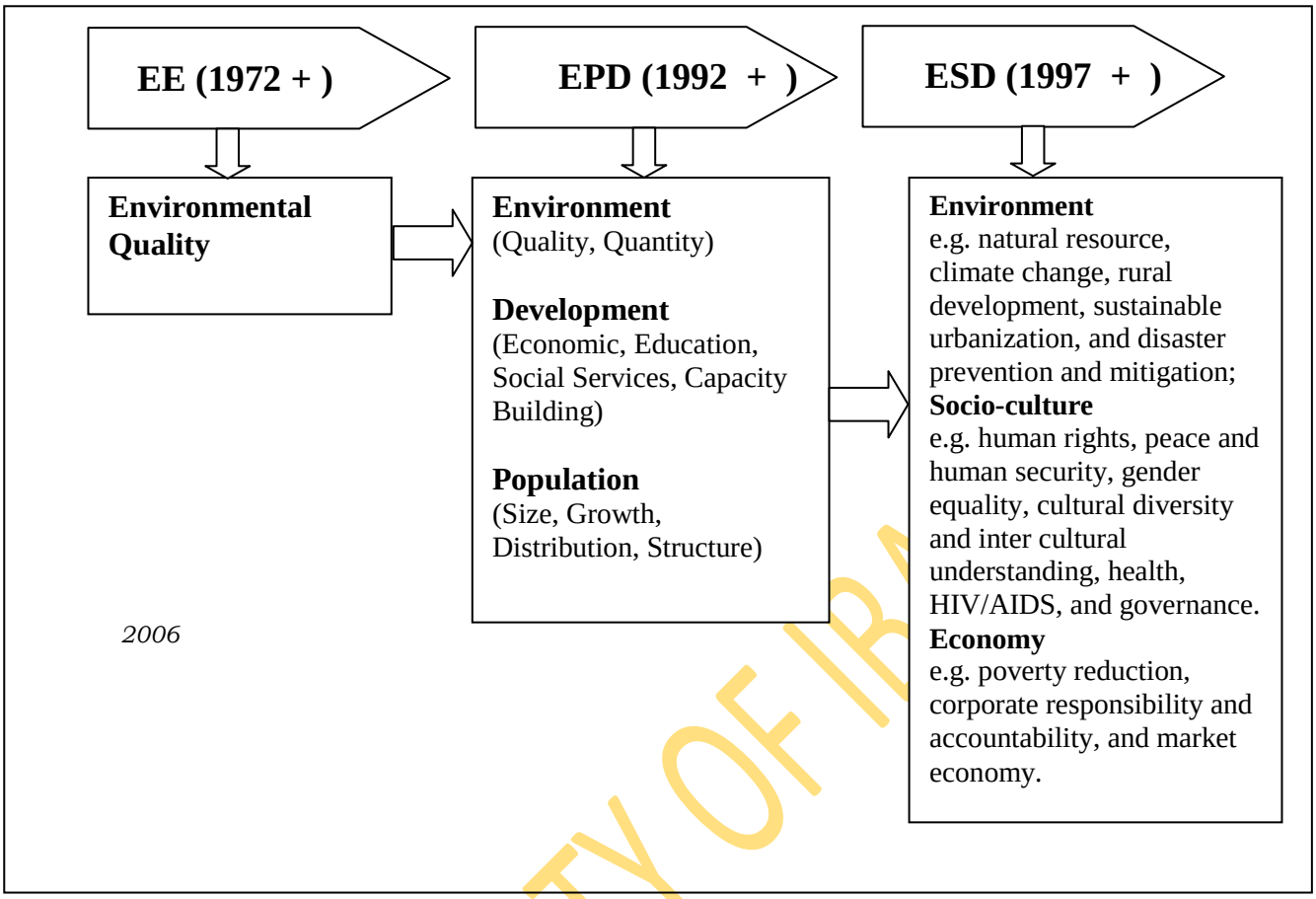

Figure 2.2: Evolution from EE to EPD to ESD ***Source: M. Sato (2006)***

The 2002 World Summit for SD (WSSD) held in Johannesburg, South Africa was a landmark event on the history of ESD. The major outcome of the summit was the endorsement of the UN Decade for Education for SD (UNDESD) for 2005 – 2014, which was later adopted by the UN general assembly in December same year. Hence, the Asia-Pacific Cultural Centre for UNESCO (ACCU) Centre of Excellence (COE) traces the roots of the history of ESD to two distinct areas of core interest to the United Nations – quality basic education and SD (ACCU,-UNESCO 2006-2010). UNESCO International Implementation Scheme (UNESCO-IIS) further notes that the overall goal of the decade:

> *...is to integrate the principles, values and practices of SD into all aspects of education and learning. This education effort as the report further reveals will encourage change in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability and a just society for present and future generations.*

The major objectives of UNDESD are: 1) to foster networking, linkages, exchange and interaction among stakeholders in ESD. 2) to foster an increased quality of teaching and learning in ESD. 3) to make countries to make progress towards and attain millennium development goals through ESD efforts, 4) to provide countries with new opportunities to incorporate ESD into education reform efforts. (UNESCO, 2005)

It is perhaps due to the enormous difficulty involved in convincing as well as in empowering school teachers, non-formal educators, policy-makers, curriculum experts and other stakeholders to change from the common practice of one-directional, teacher-centred conventional lecture approach to teaching that it has been noted by experts that moving EE to ESD will be a key challenge for the current UNDESD (UNESCO, 2005). It could be recalled that EE had earlier been criticized as lacking credibility and accuracy for its top - down approach, knowledge transfer, formal education focused and textbook based (Sanera, 1996; Menzier 1992) But in its evolving processes into ESD its current focus has been on active learner participation, high-order thinking, action research which promote bottom-top, knowledge construction, values reorientation and lifelong learning through both the formal and non-formal education.

This therefore confirms the reality of the need for the initiation of programmes that emphasize teaching/learning approaches that goes beyond theory but incorporates practical activities (Nzewi, 1998); that will reach out and involve different classes of people in activities which encourage community participation (Madumere, 2000); in

which the role of the teacher is not that of a purveyor of knowledge for rote learning and subsequent regurgitation (Gbamanja, 1998) but that of a learner as well as a facilitator as he shares from the learning opportunities and then implement collective actions and decision-making (Sato, 2006).

2.4 Adult Environmental Education

The 1977 Tbilisi Declaration stated that EE should cater for all ages and socio-professional groups in the population and that it should also be a continuous lifelong process (UNESCO-UNEP, 1978). Twenty years later the fifth International Conference on Adult Education (CONFINTEA V) of 1997, accorded an explicit recognition to adult EE by captioning one of its workshop series as "Adult Environmental Education: Awareness for Action". This provided a unique opportunity for the policy-makers, educational planners, governments and non-governmental organizations (NGO) to dialogue on the issue (UNESCO-UNEP, 1997). As part of the outcomes of the workshop deliberations participants highlighted the inhibiting factors to effective adult EE. These include that:

- Government and donor policies with regard to adult environmental education are in a precarious state.
- EE is less developed in adult and non-formal sectors than in the formal school systems
- Teaching practices in environmental adult education often tend to be limited to the transmission of knowledge rather than to promoting a critical examination of environmental problems.
- Practical solutions are seldom promoted in EE for adults.

- EE is seldom linked to the immediate environment of the participants.

In addition to discussions on the many difficulties facing the adult EE, the workshop proposed a range of possible solutions and approaches. These include a close collaboration with the community and a democratic approach to project planning and implementation. Other strategies proposed were the integration of social, political and environmental issues into adult education programmes, identifying problems and the use of experimental and creative teaching/learning methods. The active involvement of non-government organizations and local associations has been an important factor contributing to the growing prominence being given to environmental adult education.

Perhaps it is in line with efforts at charting a course for the proper integration of EE into Adult Non-formal education that Adult EE is also being referred to as Environment Adult Education (EAE). According to Summer (2003) EAE is recognized as hybrid outgrowth of the Environmental movement and Adult Education which intends to combine an ecological orientation with learning paradigm to provide a vigorous educational approach to environmental concerns. In layman's term, EAE refers to efforts in teaching environmental issues and how individuals and groups can manage or change their lifestyles and ecosystems to live sustainably. The overarching goal here is to educate the global societies to live more sustainably (Wikipedia, 2010).

In the United States of America where EE is believed to have been first recognized officially the evolution of EAE has been organized as follows:

- Mid 1970s: EAE recognized as distinct field of study
- 1980s: EAE focused on learner experience
- Late 1990s - early 2000: Focus shifted to how to teach EAE

- 1997: UNESCO hosted the international Conference on Adult Education with EAE as one of 33 workshop series presented (Wikipedia, 2010).

EAE has no doubt gained an appreciable level of acceptance in the USA where about 86% of the participants involved in a survey on environmental attitude, knowledge and behaviour, agreed with the statement that 'Government agencies should support EE for adult learners' (EETAP, 1999).

At the initial stage Adult EE was basically seen as a tool for disseminating information about the direct and indirect physical and related social impact and as a means of transmitting knowledge on the interactions between local activities and their effects which may occur in the future. With the accelerated unsustainable quest for economic development which has resulted in the realities of such devastating environmental problems as global warming, climate change, pollution, over-population, habitat devastation, poor waste disposal and management and diminishing resources, the emphasis on Adult EE was shifted beyond merely creation of awareness and dissemination of information, and knowledge (Johnson, 2003).

Moreover, results of research findings over the years have consistently revealed that EE has failed to create an environmentally literate and concerned public working towards a sustainable future (Thomson and Giateriger, 1985; Arcury and Johnson, 1987; Iozzi, 1989; Bowyer, 1990; Giglioti, 1990; Brody, 1996). EE has also been accused of losing its original emphasis on interdisciplinary and wholistic education geared towards action and change. While others also argue that EE promotes action without critical thinking (Mordock and Krasny, 2001).

In a related report on a review of the Ugandan non-formal adult EE Mucunguzi (1995) noted that EE has been characterized by a top-to-down approach which has not allowed for better conceptualization of the ideas learned by the people; and that it has less emphasis on the roles of social change, economics and politics in environmental crisis. EAE as rooted in the goal of current ESD aims at developing skills, creating a sense of commitment and stimulating individual and collective action (Johnson, 2003). This is in line with the reports of CONFINTEA V which recommends a democratic approach to programme planning and implementation, integration of social, political and environmental issues into adult education programmes and identifying problems and the use of experimental, creative, experiential and interactive teaching/learning approaches.

This may not be unconnected with the realization that there is an existing link between the changes in the physical environment and social and the political problems and that the adults constitute major actors in these areas (Johnson, 2003).

2.5 Participatory Instructional Guide for the Non-formal Adult learners

Before the introduction of the current Universal Basic Education (UBE) into the Nigeria Education System in 1999, the Department for International Development (DFID) of the United Kingdom (UK) through the British Council, began a quick and laudable response to the need for qualitative teacher education programmes, Between 1997 and 2000, the body carried out a retraining programme for teachers, head-teachers and their deputies, in three pilot Local Government Areas (LGA) in the country, namely, Biu LGA in Borno state, Mkpat-Enin LGA in Akwa-Ibom state and Isiukwuato/Umunneochi LGA in Abia State. The success story as recorded by the

Center for Primary and Non-formal Education (a centre established by the DFID of the UK from where the Resource Persons were drawn and trained for the study) in Abia State University, Uturu (ABSU) had it that the teachers who had the training subsequently adopted the method in their classrooms. Their pupils notably exhibited more interest in the lessons as such participated more actively in the teaching-learning processes. Their primary six pupils in particular, performed better in the external examinations that year than in the previous ones. While the school heads and their deputies who had began to exhibit more cordial working relationship with their teachers became more resourceful by using more locally available instructional materials in addition to other innovations introduced into the school system (Mkpa, 2001). Since the Abia State project was elected by the British Council as the best of the three pilot study areas in the country, the Centre for Primary and Non-formal Education, ABSU subsequently took the giant stride of attempting to retrain the entire teacher population in the State owned primary schools in the use of participatory instructional approaches to teaching/learning processes.

Hence in 2003, the Centre adopted the participatory programme in a state-wide, three-day training workshop series for the teacher trainees in each of the National Teachers' Institute (NTI) centres in Abia State. The reason for focusing on the Teacher Grade – Two (TCII) cadre was primarily to equip the likely would be teachers in the current UBE system with adequate knowledge and skills in the active learner participation approaches to teaching. The project so far recorded remarkable success before the TCII programme of the NTI was finally phased out in 2006. Participants were practically excited and as such participated with much zeal in all the workshop

activities for each of the three day series. Subsequently, with the directives of the Abia State Universal Basic Education Board (ASUBEB), the centre has also concluded a retraining progamme for the secretaries to the Local Government Education Authorities (LGEA), directors and some other staff of ASUBEB, as well as the head teachers and their deputies. Currently, the centre is embarking on a state-wide retraining programme for all the teachers in the pre-primary, primary and the Junior Secondary Schools (JSS). The success story is that the participants who seemed skeptical at the initial stage were later seen excitingly participating in the lessons, as the contents of the workshop programme began to unfold irrespective of their status, The articulation of the school-by-school impact of the workshop series at the classroom level is yet to be concluded as a good percentage of the teachers are yet to undergo the retraining exercise. It is expected that by the time every teacher has been retrained, all the school levels under ASUBEB, will adopt the participatory instructional approach as the recommended method of teaching/learning processes in all the school subjects. This is an indication of the level of efforts being made so far at adopting the participatory instructional programmes to offering lessons to learners and to the adults in particular in a type of a non-formal setting in Nigeria.

This study therefore focused on the development and implementation of a Participatory Instructional Programme for the Non-formal Adult EE learners, mainly because the approach utilizes the tenets of social constructivist theory whose usefulness is not just restricted to the young learners in the formal education setting, but for all categories of learners particularly, the adults in the out-of-school democratized learning environment in which they are allowed the freedom to construct their own knowledge

and be responsible for their own learning. This is has been proved to be more effective in enhancing the environmental knowledge, attitude and practices of Nigerian adults learners in the present study too.

2.6 Empirical Literature

Related studies to the present work are hereby reviewed.

2.7 Participatory Non-formal EE Programme and adult learners' environmental knowledge

In Ajiboye and Ajitoni's (2008) study of Nigerian Secondary School students, those exposed to a participatory mode of instruction performed significantly highter in their environmental knowledge than those in the control group. Also, Ajiboye and Silo (2008) carried out a study on Botswana primary school pupils and reported that those who they engaged in the participatory modes in informal Civics Education performed significantly higher in the Environmental knowledge than their counterparts in the control group. In the same vein, in Mansaray and Ajiboye's (2000) study, secondary school students exposed to participatory modes in informal Civics Education were reported to have performed significantly better than those in the control group. Oyetade's (2003) findings from her study of College of Education students also revealed that those who were engaged in the participatory EE model achieved significantly higher than their counterparts in the conventional lecture group. These corroborate the reports of the Department of Education and Training New South Wales (2010), on the occasion of its 2009 Education Week and during which students showcased their various environmental actions. The report asserts that people would develop strong Environmental Knowledge and capacity for positive environmental change when it is contextualized or taught using real examples with active-learner participation.

2.8 Participatory Non-formal EE Programme and adult learners' environmental Attitude

The studies of Ajiboye and Ajitoni (2008), Ajiboye and Silo (2008) and Olagunju (1998) reported significantly more positive attitudes of the participants exposed to their participatory modes than those of their counterparts in the control groups. However, these findings contrast with that of Oyetade (2003) in which the main effect of treatment on attitude was not significant.

2.9 Participatory Non-formal EE Programme and adult learners' environmental practices

In India a programme named Activity-Based Joyful Learning Approach (ABJLA) was developed and tested for its level of effectiveness over the conventional method in achieving minimal learning level in Environmental Studies. It was reported that the experimental group who were exposed to the programme showed better performance than the control group. It was also noted that the experimental group, in all the selected content areas, performed better in the posttest than in the pretest scores; but that was not the case with the control group who, in some cases were found to have performed even lower in the post-test than in the pre-test (Journal of Indian Education, 2004). In another setting in India, a study in the "Doing it and Telling it" series of programmes was carried out on a non-formal adult group, to create awareness about forest protection. The result was that those who participated began planting a variety of seedlings and fruit bearing plants around their homes, and communities while they also take turns to guard their forests against unauthorized or illicit destruction as well as forest fire prevention (Mahanty, 2003). These must have been triggered off with UNESCO's launching of the first phase of a pilot project in 2001 to empower rural communities

towards environmental sustainable practices in which India was among the three selected countries. The project adopted a participatory Programme to teach communities how to monitor their own environment as well as identify and address the environmental issues that are degrading their quality of life.

In the same vein, in the independent Namibia's new education policy (1991), the approach has been endorsed as the basis for reform in Education. Justifying the policy in relation to their "Towards Education for All", they assert that the, teacher-centred instruction is insufficient and frustrating to most learners, and certainly is not consistent to most learners. Hence the need to help both teachers and learners become skilled at developing and working with instructional programmes that adopt active-learner participation strategies (NIED, 1999).

With the realization that the root causes of environmental degradation and the resultant poverty are lack of awareness, information and skills necessary for making wise decisions for the sustainable use of natural resources, WWF (2008) undertook a project titled, Education for Sustainable Societies in Brazil. The project utilized a participatory programme which aimed at increasing local and institutional capacity for non-formal EE and to give the local communities the knowledge, understanding and skills necessary to actively participate in making decisions that relate to the protection of local ecosystem and sustainable management of natural resources. The success story had it that in addition to the training of individuals and conservation professionals, the programme resulted in the formation of a network of EE professionals and the institutional recognition and support for EE as a principal strategy for the conservation of the state protected areas.

In the same vein, Ngothor, Fincham and Quinn, (2004) reported on a study in which a participatory programme was developed and implemented on a workshop basis on the employees of Msunduzzi Local Government Council (LGC) South Africa. The aim of the study was to investigate the integration of Environmental Measurement System (EMS) as a tool that could be used in support of Environmental Management within the LGC. A key outcome of the project was a ready desire by the Local Government officials to have EMS framework set in place for better integration of environment activities across the departments.

According to Adhikarya (1998), one of the important resolutions of the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 was Agenda 21 which specified the need to increase environment awareness and to undertake specific public education programmes to foster sound and responsible environmental and natural resource management. It is in line with this that the Food and Agricultural Organisation (FAO) initiated a field-level Environmental Education Training (EET) programs in six of its Asian member countries namely China, Bandadesh, Thailand, Indonesia, Philipines and Malaysia. The major aim of the project is to communicate environmental issues to rural populations through direct active participation on the field. As part of the project, between 30 & 60 master trainers in all the participating countries were trained in the use of the developed programme. Each master trainer is supposed to train 15 to 20 other trainers and these trainers, in turn, are expected to train at least two groups of 20 to 25 extension workers during the project period. The success story not less than 932 EE trainers and 10,800 extension workers has been trained in the six countries. Moreover the programme has been reproduced for

wider distribution to other interested users. It has as well been personally endorsed by the highest level policy-decision-makers in Indonesia, Bangladish, China, the Philipines and Malaysia. A book on the EET programme, Participatory EE and Training for Sustainable Agriculture: Best Practices in Institutional Partnership, Peer Learning and Networking has been published by FAO..

2.10 Education Level and Environmental knowledge, attitude and practices.

Though Petters (1993) and Okeke (2004) attribute the origin of environmental problems in Nigeria to the poor environmental practices of the highly educated citizens, Ncharam and Bissong's (2007) study which consisted of 50 educated and 50 uneducated residents of Calabar South Local Government, reveals that the educated people adopted more appropriate method of waste disposal than the uneducated. Eguabor (2001) reported no significant difference in the environmental awareness of the educated and uneducated women in his study of women as environmental managers.

2.11 Gender and Environmental knowledge, attitude and practices

In Ahove's (2007) study, though the students were generally reported to have favourable attitude toward sustainable development of the environment the females had higher mean score than their male counterpart. However the males are significantly better than the female in terms of environmental practices. Eguabor (2001) reports that women frequently interact with the environment but they are unaware of the impact of their activities on the environment as such they are not aware of the measures to abate the negative effects of their activities. She thus recommended that the Local Government Authorities should endeavour to carry out an EE orientation workshop for the various communities.

2.12 Appraisal of Literature

The review of literature revealed that EE, both in the formal and non-formal education sectors is a veritable tool for realizing the goals of Sustainable Development (UNESCO, 2002; Gyallay – Pap, 1997). Literature abounds on studies and efforts by the Government, individuals, and other agencies on the environmental outcomes of pupils and students in the formal school system (FME 2000; FEPA, 1995) while there still exist a dearth of works or studies on the Non-formal Adult EE (Okeke, 2004). This accounts for the significantly low environmental knowledge (WWF, 2000; Dokun, 1999; Nzewi, 2001; Eguabor, 2001; Eugene, 2004; NTA, 2008); attitude (Eguabor, 2001; Nzewi, 2001; Mansaray, Ajiboye & Audu 1998) and practices (Mansaray, Ajiboye and Audu 1998; Noibi, 1993; Ncharam, 2007) of Nigerians.

Mean while scholars have argued that the people outside the formal education sector constitute the larger percentage of the world's populations (EETAP, 1998) and that adults are more likely to be significant players on environmental issues than children (Slattery, 2000); as they are the present day parents, farmers, industrialists, engineers, traders, fisher men and women, drivers, auto mechanics as well as miners who impact negatively on the environment (Peters, 1995). Hence they should be supported by Environmental Educators to actively participate in critical and creative EE programmes in order to bring about a lasting solution to current environmental degradation problems (Clover, 1998; Aghoolor, 1993). This is in line with UNESCO'S report at the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 which emphasizes that the major reason for focusing on Adult EE for Sustainable Development (SD) is that it would be unwise to wait for the present

generation of school and college students to grow up to begin to apply what they have learnt. Moreover, as Aghoolor, (1993) asserts the success of EE at the Non-formal Education level means the success in conserving the environment considering the large number and various groups of learners targeted at the Non-formal sector.

As a way of ensuring an adequate and effective Non-formal EE in Nigeria scholars have advocated for the development and implementation of Participatory EE programmes in which people would actively participate in constructing their own leaning about the environment (Madumere, 2000; Nzewi, 1999; Aghoolor, 1993; Gbamanja, 1998). This is necessary particularly in the present situation where most efforts in the area of Non-formal EE in Nigeria tend to begin and end on creating environmental awareness through the Non-participatory approaches to Non-formal EE including the Radio and TV jingles, panel discussions, documentaries, essay writing competitions, and award presentations (FME, 2000; FEPA, 1995). Though there is a dearth of literature on Participatory Non-formal EE Programmes in Nigeria, countries in which such programmes have gained appreciable level of acceptance the success stories reveal significant level of improved environmental outcomes among the people (Mahanty, 2004; WWF, 2008; Ngothor, Fincham & Quinn, 2004; Adhikarya, 1998).

Furthermore, the literature reviewed tends to indicate that the issues of gender and education level and their effects on people's environmental knowledge, attitude and practices still stand unresolved. While some studies attribute the causes of environmental problems in Nigeria to those in the high Education level (Noibi, 1993; Okeke, 2004) other reports either contrasted this or showed no significant difference in the environmental outcomes of the high and low education levels (Ncharam & Bissong,

2007; Eguabor, 2001). Similarly in Ahove's (2007) study, while the females displayed more favourable attitude to environmental issues than the males, the males on the other hand were significantly better in environment practices. Eguabor (2001) categorically reports that woman who frequently interact with the environment, are unaware of the impact of their activities on the environment as such they are not aware of the measures they could adopt to abate the negative effects of their activities.

This study therefore centered on the development and implementation of a participatory Non-formal EE programme for the adult learners as a way of augmenting the existing Non-participatory approaches to Non-formal EE and also to provide a more innovative approach to effectively impact their environmental outcomes which is attainable through active learner participation teaching / learning processes.

CHAPTER THREE

METHODOLOGY

This chapter focuses on the methods adopted for the study . These include the research design, variables of the study, sample selection, instruments and validation, procedure for the study and method of data analysis.

3.1. Research Design

The study adopted the participatory approach to Non-Formal EE for adult learners. A Participatory Non-formal EE Instructional Programme was developed by the researcher following the guidelines for the Development of Non-formal EE (Guidelines for Excellence) published by the North American Association for Environmental Education (NAAEE, 1994). The development of the programme was further posited on the technological model of programme design. The step-by-step facets of the model include: contextual analysis, aims and objectives formulation, prototype construction phase, programme interpretation/ implementation, programme recycling/revision, programme installation and of course the monitoring and assessment which is central to all the phases.

The study also adopted the pretest, posttest, control group quasi-experimental design.

This design is schematically represented as:

O_1 X_1 O_3 - - - Experimental group

O_2 X_2 O_4 - - - Control group

where

O_1 and O_2 are pretest observations for experimental and control groups respectively.

O_3 and O_4 are posttest observations for experimental and control groups respectively.

X_1 is the experimental strategy of participatory instructional programme.

X_2 is the conventional lecture method.

This design also employed the use of a 2 x 2 x 2 factorial matrix. This is presented on Table 3.1

Table 3.1: 2 x 2 x 2 Factorial Matrix of the study variables.

Treatment	**Gender**	**Educational background**	
		Low	**High**
Participatory instructional programme	Male		
	Female		
Conventional lecture method	Male		
	Female		

3.2 Variables of the Study

The variables of the study are the independent variable, moderator variables and dependent variables.

3.6.1 Independent Variable

There is only one independent variable and this is mode of instruction at two levels:

(i) Participatory Non-formal Adult EE Instructional Programme

(ii) Conventional lecture method (control condition)

3.6.2 Moderator variables

There are two moderator variables.

(i) Education level at two levels (low and high)

(ii) Gender at two levels (male and female)

3.6.3 Dependent variables

There are three dependent variables:

(i) Environmental knowledge

(ii) Environmental attitude

(iii) Environmental practices

3.3 Selection of Participants

The target population for this study comprised the non-formal adult learners in the Adult Literacy Centres in Oyo State who are currently undergoing classes equivalent to the secondary school levels of the formal education system. Two centres were purposively selected and randomly assigned to the experimental and control groups for the purpose of this study. The intact classes of the adult learners were used

such that 79 participants were in the experimental and 75 for the control groups. This summed up to a total of 154 adult learners out of which 72 were drawn from JSS 1 and 2 and represented as Low Education Level, and 82 from JSS3 and SS1 as the High Education Level for the purpose of this study. This consisted of the 87 males and 67 female adult learners sampled for the study. This strictly comprised of participants who had at least 90% attendance as evidenced in the attendance register adopted in the course of the study. The University of Ibadan Adult Education Centre, Emmanuel College, Ibadan was used as the experimental group while the Baptist Adult Literacy Centre, Baptist Grammar School Ogbomosho served as the control group.

With the aid of the research assistants, the treatment commenced and ended at the same time in the Adult literacy centres for both the experimental and control groups.

3.4 Research Instruments

Six instruments were used in the study. These are:

1. Participatory Non-formal Adult EE Programme
2. Instructional Guide for the Participatory Non-formal Adult EE Programme
3. Conventional Lecture Method Guide
4. Environmental Knowledge Test (EKT)
5. Environmental Attitude Questionnaire (EAQ)
6. Environmental Practices Questionnaire (EPQ)

3.4.1 Participatory Non-formal Adult EE Programme

This was developed by the researcher based on the guidelines for the Development of Non-formal EE published by the North American Association for Environmental Education (NAAEE, 1994) and further posited on the Technological

Curriculum Model to equip the non-formal adult learners with the necessary attitude, knowledge, and skills that will enable them to act sustainably in the environment. The major features of the Guidelines for Excellent by NAAEE are as follows:

1. Needs Assessment

This was undertaken at the following three levels:

(a) Audience Needs

The EE needs of the Non-formal adult learners who constitute the target audience for this study were ascertained through organized visits to the various stake holders namely the federal and state ministries of Environment and Education, the parastetals under them including the Environmental Protection Agencies, the Nigerian Education Research Development Council (NERDC), Science Teachers Environmental/Action Team (STAN), Agency for Adult and Non-formal Education (AANFE), Centre for Environment and Science Education (CESE) of the Lagos State University (LASU), Department of Adult Education University of Ibadan, consultations with the experts in the Department of Teacher Education, University of Ibadan and interactive sessions with the teachers and adult learners in the literacy centres used for the study.

b) Inventory of Existing Programmes

The various consultations made by the researcher revealed that NERDC has developed EE curricular for the primary and secondary schools as well as EE guidelines for the tertiary levels of the formal education sector but none for the Non-formal education level.

The peripheral efforts at the non-formal EE are basically non-participatory in approach, while the very few attempts by individuals did not target the non-formal adult learners in the literacy centres with participatory non-formal EE Programmes.

c) Identification of EE contents to be addressed

The EE contents addressed in the programme were arrived at from the outcomes of the preliminary consultations by the researcher, the interactive sessions with teachers and participants in the study particularly those in the experimental group, as well as the recommendations of UNESCO (1986) for content selection for Non-formal EE which states that:

a) any meaningful EE programme content should be selected in an order that begins with providing the learners with the awareness of their immediate environment and

b) progresses in an order that helps to foster learners' innate curiosity and enthusiasm, providing them with continuing opportunities to explore their environment.

It is based on these that the following eight concepts that constituted the contents of the present Non-formal adult EE programme were selected:

- Meaning of environment
- Natural environment
- Importance of the different parts of the environment.
- Ways the different parts of the environment depend on each other (Ecosystem)
- Human activities (Development).
- Effects of human activities on the different parts of the natural environment.
- Human factors that affect the environment
- Environmental friendly habits (Sustainable Development).

2. Assessment of programme initiator's needs and capacities

This step involved the following:

(a) Goals and priorities of programme initiator

The present Participatory Non-formal EE programme was initiated by the researcher with the aim of determining its impact on the adult learners in the literacy centres in Oyo State Nigeria.

(b) Identification of the initiators need for the programme

The need for this Non-formal EE programme is necessitated by the researcher's concern for the current alarming rate of environmental degradation and deterioration in Nigeria with particular reference to Oyo State as well as the erroneous neglect of the Nigerian population currently outside the formal school system, and who incidentally constitute the larger percentage of people who deplete the environment most by the various constituted authorities on EE issues. The programme was therefore developed for the Non-formal adult learners in the literacy centres as a way of augmenting the existing non-participatory approaches to Non-formal EE as well as to provide an innovative and more effective way of impacting their environmental knowledge, attitude and practices which is attainable through active learner participation teaching/learning processes.

(c) Determination of the resources available

The resources needed for the programme were both financial and material. The finance was made available by the researcher. While some aspects of the materials were provided by the researcher others were made available by the Literacy centres used for the study. The recourses provided by the researcher included writing materials namely,

exercise books, cardboard papers, masking tapes, biros, pencils, plastic files, rulers, erasers and sharpeners for all the participants in the study to elicit their effective participation. The Adult Literacy centres involved in the study provided the venues where the teaching/learning activities were undertaken, chalkboards, chairs and tables..

3. Programme Scope and Structure

At this stage the researcher considered the:

a) Programme Goals and aims

The major goal of the programme was to effectively impact the environmental knowledge, attitude and practices of the adult learners in the non-formal literacy centres in Oyo state of Nigeria. In the process the adult learners were:

- Provided with a democratized learning environment that would make learning fun and interesting as they engage in a variety of activities that enhance learning.
- Encouraged by the facilitator to construct their own meaning of the EE concepts by engaging them in those activities they were already used to.
- Provided with an alternative to the non-participatory approach to non-formal EE.

(b) Assess overall fit with the field of EE

The present Participatory non-formal EE programme is in line with the overall goals of EE which stipulates that EE should be undertaken at both the formal and the non-formal education sectors. And it is a response to the clarion call for participatory, learner-centred, activity-based teaching/ learning approaches to EE programme as opposed to the non-participatory, teacher-centred, one-directional approach.

(c) Programme format and delivery strategy

The programme format is interactive in nature and delivery strategy is active-learner participation approaches to teaching/learning in which the learner is actively involved in constructing his own knowledge of the environment with minimal teacher interference.

4. Programme Delivery Resources

This involves the following stages:

(a) Staff competence and training needs

Four out of the twelve adult teachers in the literacy centre used for the experimental group were purposively selected and trained by the researcher as research assistants for the study. Their selection was on the basis that they teach any of the subjects through which components of EE have been infused into the Nigerian school curriculum. Hence the research assistants comprised the Agricultural Science, Integrated Science, Social Studies and Biology teachers. These were trained by the researcher for two weeks.

(b) Organization of the needed facilities

The facilities needed for the programme, including the classrooms, chalkboard,, chairs for the participants were inspected and organized by the researcher with the aid of the research assistants to ensure their fit and suitability for the effective and efficient execution of the programme. The writing materials were packaged in the plastic files and distributed to the participants at the commencement of the programme. Copies of the Participatory Non-formal EE programme as well as the instructional guide for implementation of the programme were made available to the research assistants. They

were also provided with the cardboard papers, markers, masking tapes for distribution to participants as the need arose.

5. Programme Quality and Appropriateness

This is assessed in the following stages:

(a) Obtaining/developing educationally sound materials

The instructional materials used in carrying out the activities involved at the different stages of the EE programme were locally accessible and as such were easily sourced from the immediate environment, organized and used by the participants with the guidance of the facilitators (research assistants).

(b) Field-test the instructional materials

The programme was tried out on a sample of non-formal adult learners in an adult literacy centre other than those used for the main study to establish its effectiveness in impacting their environmental knowledge, attitude and practices.

6. Evaluation

The interactive and participatory nature of this EE programme provided the rare and unique opportunity for assessing the performance of learners, which are hardly attainable in programmes of this nature where terminal examinations are not expected to be administered on participants. The input by the members of the class as they made critique of each group's presentations provided an on-the-spot feedback on learners' performance. This at the end of the day and with the aid of the facilitators produced a summary and conclusion for the lessons as a product of everyone's effort.

The step-by-step facets of the Technological curriculum model on which this Non-formal EE programme was further posited are:

- Contextual Analysis
- Aims and objectives formulation
- Prototype construction
- Programme interpretation/Implementation
- Recycling / revision
- Programme installation
- Monitoring and assessment

Contextual Analysis: At this stage the researcher:

i) Visited the Federal Ministry of Environment as well as the Oyo state ministry of Environment to obtain an up-to-date profile of both the national and state's environmental condition.

ii) Visited the Oyo state ministry of Education from where she obtained information on efforts so far on EE generally and on Non-formal Adult EE in particular, as well as made contacts with the Nigerian Education Research and Development Council to information on the curricular efforts on the Non-formal Adult EE.

iii) With the approval of the Head of Service, office of the Governor, Oyo State, the researcher also visited the Agency for Adult and Non-formal Education (AANFE) to obtain a detailed information on the Adult Literacy centres in Oyo State including location of the centres, class levels, population, time-tables, and characteristics of learners as well as obtained the permission to visit the sampled centres for the study.

iv) The researcher also consulted with the Department of Adult Education University of Ibadan for the necessary guidance as well as assistance in convincing, organizing and encouraging the teachers and the adult learners in the centre to participate in the study.

v) The researcher then personally contacted and interacted with both the teachers and the learners in the sampled adult literacy centres

In this process the researcher discovered that:

-- neither the Federal nor the Oyo state government has conceived of any participatory instructional EE programme specifically for the Adults outside the formal school system.

-- despite the problem of not having full-time teachers who are aware of the infused environmental concepts in some of the existing Junior Secondary (JS) and Senior Secondary (SS) curriculum, there are still no other attempts at EE for the learners in the Adult literacy centres.

-- the Adult literacy centres are categorized into the basic literacy classes, post literacy classes and Advance literacy classes all of which constitute an equivalent of the regular primary school class levels in the formal education sector. As such the language of instruction at this level, as recommended by the Nigerian Education policy is basically the mother-tongue. This therefore informed the choice of centres that offer classes that are equivalent to the JS and SS schools and where English language constitutes the language of instruction for the study. The researcher thus directed subsequent visits to such centres as they would form the sample for the study.

Further interactions with the two Adult Literacy Centres sampled for the study revealed that their lessons lasted for only three hours of two lesson periods daily. That is between 3.30 - 6.30 p. m. With the short period of time at their disposal in the learning centres the adult learners did not oblige the researcher's initial plan to engage them extensively in both the development and implementation stages of the programme. Unlike the younger learners in the formal school settings the basic characteristic of the adult learners is that they are set in their minds to focus on the specific needs that motivated their enrolment in the literacy centres some of which include the need for certification for promotion on their jobs and political appointments, acquisition of the skills of reading, writing, record keeping for their businesses and fluency in speaking English language. As such they display a high level of impatience for any other activities that are not directly part of their regular class time-tables since they perceive such as ways of wasting their time, energy and transport fare spent for attending the day's lessons. In the face of these inhibiting factors the researcher was only able to arrest their interest to participate in the study after much negotiation part of which resulted in restricting their participation in the development of the programme to just one interactive session.

Objectives of the Programme: The objectives of the programme include that the adult learners should be able to:

- develop a wholistic idea about their immediate environment
- identify the various environmental resources
- identify the value of the inter-relationships among the components of the environment.

- attach values to the various environmental resources
- differentiate between friendly and unfriendly environmental practices and habits.
- assess the negative impact of unfriendly human activities on their immediate environment
- develop affection and positive attitude towards the environment.
- engage in environmental friendly activities and act in a sustainable manner.

The prototype construction: The technological model emphasizes strict adherence to active-learner participation instructional theories. As such the development of the programme was based on the outcome of the interactive sessions with the Adult Literacy centre sampled for the experimental group for the study and UNESCO's (1986) recommendations for the development of Non-formal EE programmes which states that:

a) any meaningful EE programme content should be selected in an order that begins with providing the learners with the awareness of their immediate environment and

b) progresses in an order that helps to foster learners' innate curiosity and enthusiasm, providing them with continuing opportunities to explore their environment.

It is based on these that the eight concepts that constituted the contents of the present Non-formal adult EE programme were selected. The selection of the concepts also spans the existing four major broad themes of EE namely:

1. Ecological foundation – which includes all the resources of the natural environment

2. Human environment/development – which deals with forms of human activities in the environment

3. Environmental change/impact – which embraces all issues and problems resulting from human activities

4. Sustainable development – which involves all management activities/efforts undertaken towards the environment from a generation to generation (Adara, 1992).

The distribution of selected concepts is presented in Table 3.2

TABLE 3.2: Environmental Education (EE) Major Broad Themes

Broad EE Themes	**Selected EE Concepts**
A. Ecological Foundation	1. meaning of environment 2 human factors that affect the environment 3. natural environment 4. importance of the different parts of the environment 5. ways the different parts of the environment depend on each other (ecosystem)
B.Human Environment/ Development	- human activities (development)
C. Environmental Change/Impact	- effects of human activities on the different parts of the natural environment
D. Sustainable Development	- environmental friendly habits (way forward)

The choice of wider coverage of topics under the Ecological Foundation as revealed in Table 3.2 is to offer the learners a good background in the nature, scope and interrelationship of the components of environmental resources in their immediate environment (UNESCO, 1996). Details of the prototype construction for the present non-formal EE programme is presented on appendix I.

The implementation of the technological model of programme development was based on the social constructivists' instructional theory. This was deemed appropriate

because it emphasizes learner-centered approaches to learning which has been proved to be more effective and innovative teaching/learning approach. It is also particularly suitable for non-formal adult EE since many adults can learn best in a socially democratized context. Therefore, the concepts and issues considered in the programme could be more effectively learned. Also the target population in the Non-formal Adult literacy centres, who are likely to participate more comfortably in small group activities than in a typical problem – solving setting which may require high order analytical skills and competencies. Moreover, the generality of the participants are afforded the opportunity to be actively involved in all the lessons. The main steps for the instructional Guide for the implementation of the present Participatory Non-formal EE programme are in the following order:

- Organizing learners into groups: The facilitator organizes the learners into small groups depending on number of learners available in class.
- Group activities: Group members engage in activities in relation to the concepts being studied
- Group presentations: Members of the individual groups present their decision to the entire members of the class.
- Whole class input/discussion: Members of class make input/discussion on the individual group's presentations
- Summary: The facilitator and the members of class summarize the lesson.
- Evaluation: The facilitator and the members of class then evaluate the lesson.

Furthermore, since most content areas in EE are such that the core aspects can be learnt at the earliest levels while same contents may still be progressively learnt in

deeper details, the tenets of spiral curriculum model is hereby reflected. According to Brunner (1977), any subject matter which is relevant to the adult and which after knowing it as a child can make people better adults can be developed as a spiral curriculum. EE is one of such subject matters.

For the programme interpretation/implementation phase, the programme was sent to experts in the field of Education and Environmental Education as well as colleagues of the researcher for their inputs. After this, the necessary corrections were effected.

At the recycling/revision phase, the programme was revised after the necessary adjustments based on the outcomes of the implementation. Subsequently, the programme was then ready for installation in the main study.

3.4.2. Instructional Guide for the Implementation of the Participatory Non-formal Adult EE Programme

This instrument was developed in line with the social constructivist instructional theory to impact the environmental knowledge, attitude and practices of Non-formal adult learners. The contents of the instructional guide include the introduction, objectives and the steps for using the programme. Its major steps include:

- Organizing learners into small groups by teacher (facilitator)
- Group activities by learners in the individual groups
- Group presentation to the whole class by members of the individual groups on group-by-group basis
- Whole class inputs/discussions
- Summary by facilitator and learners
- Evaluation by facilitator and learners

3.4.2.1 Validation of the Instructional Guide for the Participatory Non-formal Adult EE Programme

The first draft of this instrument was subjected to the scrutiny of experts in the field of EE, Non-formal education and some colleagues of the researcher for their input in terms of relevance of the programme to the learners, its instructional steps, appropriateness of time allocation, appropriateness of activities and instructional materials. Based on their comments necessary modifications were effected. The instrument was also implemented on a sample of Non-formal adult learners in one adult literacy centre who were not to be part of the sample for the main study. Based on the identified inadequacies corrections were effected and the instructional guide revised. Some of the reactions at the trial stage include that:

1. The participants exhibited a high level enthusiasm. They were so interested in the activities that they in most cases attempted to over stretch the actual two-hour period in virtually all of the selected concepts for the study. The researcher personally had to intervene to ensure that they work within the stipulated time.
2. The random placement of participants in groups was not acceptable to many as they still preferred to cluster in groups where their friends and close associates were placed. However the researcher insisted on random grouping since the main essence of putting them in small groups is to ensure that the adults of varying learning abilities, social group and gender are brought together to learn from each other in a democratized setting.
3. A few of the participants at the initial stage shied away from coming out as group representatives to present their group's works or decisions. The researcher

used extrinsic motivation in appealing to those who came out to participate. This encouraged several others to join later.

4. The whole class input/discussion session generated much argument as people from varying social background and beliefs presented their views. The situation was always moderated by the researcher to ensure that the participants amicably arrived at acceptable conclusions themselves.

5. In the area of the contents, the concepts that formed the contents of the programme mirrored the learning needs of the participants as all of them took part in the lessons with much zeal. None showed any sign of boredom but were all actively involved in the activities. The contents also tend to be central to the varying education levels of the adult learners in the selected literacy centre which ranged from JS 1 to SS 1.

6. The two-hour period on Monday as earlier agreed 3.30 p.m to 5.30 p.m was found to be adequate both for an extensive coverage of the contents and for sustaining the attention and the interest of participants.

Based on the identified inadequacies, corrections were effected and the instructional guide revised and made ready for installation in the main study.

3.4.3 Conventional Lecture Method Guide

This is the conventional teacher-centred approach in which the learner only listens as the teacher discharges the fact without giving him the opportunity to participate in the lessons. Its steps include:

- The teacher introduces the concepts
- The teacher discusses facts or ideas on the concepts in steps
- The teacher gives notes on the concepts

- The teacher asks questions

- The teacher gives assignments to students (Ajewole 1997).

3.4.4 Environmental knowledge Test (EKT)

The EKT was developed by the researcher to measure the participants' environmental knowledge both before and after treatment. It consists of two sections, namely, sections A and B. Section A sought for socio-demographic data such as age, gender and education levels of the adult learners. While section B consists 30 objective test items with options

A – D which include only one correct option. The EKT was scored by allotting 1 mark to each correct option.

Its main objectives include ascertaining the level of the non-formal adult learners' acquisition of environmental knowledge and experiences in the selected environmental concepts for the study so as to assist them individually and collectively to get involved in the sustainable environmental habits. It was also designed to measure the extent to which the Non-formal Adult learners are involved in applying their environmental knowledge in solving immediate and future environmental problems in their quest for development and survival. It also measures the Non-formal adult learners' ability to express their understanding of the selected environmental concepts as they relate to them as individually and the society at large (Mansaray and Ajiboye, 1997). All the items were drawn in line with Bloom's taxonomy of cognitive domain/education objectives as modified by Okpala (1991) to include knowledge, application and comprehension. The table of specification for the construction of EKT as presented on table 3.3 shows that the non-formal adult learners' knowledge of the

selected concepts for the study has 9 questions, the extent of their comprehension, 12 questions while application covers 9 questions.

Table 3.3: Environmental Knowledge Test (EKT) Blue Print

S/N	Topics	Knowledge	Comprehension	Application	Total
1	Meaning of Environment	1,3		2,4	4
2	Human factors that affect the environment		7,8	5,6	4
3	Natural Environment	9	10	11,12	4
4	Importance of the different parts of the natural Environment	16	13,14	15	4
5	Ways the different parts of the natural environment depend on each other (Ecosystem)	17	18,20	19	4
6	Human Activities (Development)	22,23	21,24		4
7	Impact of human Activities on the different parts of the natural Environment	27	25	26	3
8	Environmental friendly habits (sustainable development)	30	28,29		3
	Total	9	12	9	30

3.4.4.1 Validation and Reliability of EKT

The initial 50 questions were subjected to peer and expert review to ensure the construct and content validity of the test as well as its appropriateness for the target learners. It was based on their inputs that the final draft of 40 questions was derived. The test items were thereafter reduced from 40 to 30 based on too high or too low difficulty indices. For reliability of the test items, the final draft of the test was administered on a sample of one Adult literacy centre not selected for the study. Their responses were used to compute KR-20 in order to test for reliability and average item difficulty. This yielded an average item difficulty index of 0.52 and the reliability index of 0.79.

3.4.5 Environmental Attitude Questionnaire (EAQ)

The EAQ was designed to test the affective domain of the non-formal adult learners on the EE selected concepts for the study. In more specific term, the instrument will measure:

1. the level of the learners' sense of responsibility towards the environment
2. the extent of the learners attainment of the environmental-friendly values and ethics
3. the level of the learners' aesthetic endowment towards the environment.

This is developed to test the participants' sense of responsibility, feelings and level of value they have for the environment. It also consists of sections A and B. Section A consists of the demographic data of participants while section B comprised of 30 items which consist of modified likert 4-point scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). The items were scored by allotting 4 points to SA, 3 to A, 2 to disagree and 1 to SD for positively worded statements. This reserved reversed, for the negatively worded items by allotting 1 point to SA, 2 point to A, 3 point to D and 4 point to SD. The 30 items consists of 17 negatively and 13 positively worded items. Table 3.4 presents the table of specification on the EAQ.

Table 3.4: Table of Specification for the Environmental Attitude Questionnaire (EAQ)

S/N	EE concepts in the programme	Number of negatively worded statements	Number of positively worded statements	Total
1	Meaning of environment	1,2,3 (3)	4 (1)	4
2	Human factors that affect the environment	6 (1)	5,7 (2)	3
3	Natural environment	10,11 (2)	8. 9 (2)	4
4	Importance of the different parts of the natural environment	12,13 (2)	14,15 (2)	4
5	Ways the different parts of the environment depend on each other (Ecosystem)	16,18 (2)	17 (1)	3
6	Human activities (Development)	20,21,22 (3)	19 (1)	4
7	Effects of human Activities on the different parts of the environment	25 (1)	23,24 (2)	3
8	Environmental friendly habits (Sustainable Development)	26,28,29 (3)	27, 30 (2)	5
	Total	17	13	30

3.4.5.1 Validation of EAQ

An initial 50 items were drawn and subjected to peer and expert review to determine their appropriateness with reference to the targeted learners. This was also used to establish its content validity. Based on their inputs, modifications were effected and draft of 40 items was realized and then tried out on a sample of Non-formal Adult learners in one Adult literacy centre other than those to be used in the main study. For reliability, copies of the draft administered were subjected to Crombach method and reliability coefficient of 0.83 was obtained.

3.4.6 Environmental Practice Questionnaire (EPQ)

The EPQ was developed by the researcher to determine the learners' level of participation with respect to the selected environmental concepts for the study. It consists of sections A and B. The section A was on the demographic data. Section B consists of 30 items to which participants will respond by indicating the extent to which they practice the items listed on a 4-point scale ranging from Very Often (VO), Often (O), Seldom (S) and Never (N). The items were scored by allotting 4 points to VO, 3 to often, 2 to seldom and 1 to Never for positively stated items. This was reversed for negatively stated items. See Table 3.5 for details of table of specification on EPQ.

Table 3.5: Table of Specification for the Environmental Practice Questionnaire (EPQ)

S/N	EE Concepts taught in the programme	Negatively stated items	Positively worded items	Total
1	Meaning of environment	3, 4 (2)	1, 2, (3)	4
2	Human factors that affect the environment	5, 7, (2)	6, (1)	3
3	Natural environment	9 (1)	8, 10, (3)	4
4	Importance of the different parts of the natural environment	12,13 14 (3)	15 (1)	4
5	Ways the different parts of the natural environment depend on each other (Ecosystem)	17 (1)	16, 18, (2)	3
6	Human Activities (Development)	21 (1)	19, 20, 22 (3)	4
7	Effects of Human Activities on the different parts of the natural environment	23,24,25 (3)		3
8	Environmental friendly habits (Sustainable Development)	29, 26 (2)	27, 28, (2)	4
	Total	14	15	29

3.4.6.1 Validation of EPQ

An initial 50 items were drawn and subjected to peer and expert review to determine their appropriateness for the target learners. It was based on their comments and modifications that a draft of 40 items was drawn. The reliability of the instrument has been determined by administering the 40 items to a sample of Non-formal Adult learners who were not part of those selected for the main study. Their responses were used to compute the reliability coefficient using the Cronbach Alpha formula. The 40 items were subsequently reduced to 29 based on the inter-item correlation. Here, items with negative correlation were removed. This produced an alpha value of 0.78 which showed that the instrument is reliable.

3.4.7 Assessment Sheet for Evaluating the Effective Use of the Instructional Guide by the Research Assistant

This was used to assess the extent of the research Assistants' effectiveness in the use of the Participatory Non-formal Adult EE programme. This consists of two sections: Section A comprises the name of research assistant, name of Adult literacy centre taught and date. In section B the different stages of the programme are assessed to measure the congruence in the research-assistants' performance in the delivery of the lessons with the actual steps and activities laid out in the programme.

3.5 Research Procedure

This study was carried out in 4 stages namely:

- Training of research assistants
- pretest
- administration of instrument (Treatment)
- posttest

The research procedure is represented on table 3.6.

Table 3.6: Details of the Work Schedule for the Study

S/N	Activity	Duration
1	Training of Research Assistants	2wks
2.	Pretest	1wk
3.	Treatment	8wks
4	Posttest	1wks
Total duration		12wks

3.5.1 Training of Research Assistants

The four research assistants who were involved in administering the Participatory Instructional Programme on the participants in the four class levels, JS 1, 2, 3 and SS 1 used as the experimental group were trained by the researcher for two (2) weeks. At the commencement of the training the three instruments for the study, the EKT, EAQ and EPQ were administered on the Research Assistants as pre-test to ascertain the level of their Environmental knowledge, attitude and practices. This was followed by a plenary session and the actual engagement of the research assistants by the researcher on the series of activities contained in the Instructional programme. The four research assistants were selected by the researcher based on the condition that:

1. They are the regular teachers in the Adult literacy centre selected for the study.
2. They teach the subjects through which the EE components have been infused into the Nigerian school curriculum at the secondary school levels in particular.

These include the Social Studies, Agricultural Sciences, Integrated Sciences, and Biology teachers.

3. They voluntarily accepted to serve as Research Assistants for the study.

The three instruments, EKT, EAQ and EPQ were also administered on the research assistants after their training, as post-test to ascertain the extent to which the developed Participatory Non-formal Adult EE programme has enhanced their environmental knowledge, attitude and practices. Each of the four trained research assistants were randomly assigned to each of the four class levels in the experimental group.

3.5.2 Pretest

Before the commencement of the teaching/learning processes, the researcher with the aid of the research assistants administered the EKT, EAQ and EPQ on the experimental and control groups as pre-test to ascertain their level of environmental knowledge, attitude and practices. This lasted for one week.

3.5.2.1 Treatment Administration

3.5.2.1a Participatory Non-formal Adult EE Programme

Each of the four trained research assistants engaged the participants in the respective four class levels in the experimental groups in the main treatment using the Participatory Non-formal Adult Learners' Instructional programme Guide which is developed by the researcher following the social constructivist instructional theory. The main steps involved include:

- Organizing learners into small groups by teacher (facilitator)
- Group activities by learners in the individual groups

- Group presentation to the whole class by members of the individual groups on group-by-group basis
- Whole class inputs/discussions
- Summary by facilitator and learners
- Evaluation by facilitator and learners

3.5.2.1b Conventional Lecture Method

The control groups were taught with a well constructed lecture series on the same selected contents taught those in the experimental groups. In this case the lessons were delivered using the modified conventional lecture method which consists of the following steps:

- teacher introduces the concepts
- teacher discusses facts or ideas on the concepts
- teacher gives notes on the concepts
- teacher asks questions
- teacher gives assignment to students.

The treatment lasted for eight weeks and ran concurrently with those in the experimental groups.

3.5.3 Posttest

At the end of the treatment the EKT, EAQ and EPQ were administered on both the experimental and control groups as posttest to ascertain the extent to which the environmental knowledge, attitude and practices of the participants have been enhanced by the treatments.

3.6 Data Analysis

Data collected were analyzed using Analysis of Covariance (ANCOVA). The Multiple Classification Analysis (MCA) was used to define the magnitude of the mean scores of the various groups. For significant 2-way interaction effects, graphs were used to explain the nature of such interactions.

CHAPTER FOUR

RESULTS

This chapter presents the results of this study. The results of the analysis carried out are presented according to the sequence in which the null hypotheses were tested.

4.1 Presentation of Results

4.1.1 Hypothesis 1a: There is no significant main effect of the participatory Non-formal EE Programme on the Adult Learners' Environmental Knowledge.

Table 4.1: Summary of ANCOVA of Posttest Knowledge Score by Treatment, Education level and Gender

Source of Variance		Hierarchical Method				
		Sum of Squares	Df	Mean Square	F	Sig.
Covariates	PRE-KNOWLEDGE	563.082	1	563.082	37.190	000
Main Effects	(Combined)	3275.074	3	1091.025	72.059	000
	TREATMENT	3168.989	1	3168.989	209.303	000*
	EDUCATION LEVEL	102.983	1	102.983	6.802	010*
	GENDER	1.102	1	1.102	073	788
2-Way Interactions	(Combined)	122.374	3	40.671	2.694	048
	TREATMENT x EDUCATION LEVEL	96.671	1	96.671	6.385	.013*
	TREATMENT x GENDER	3.784	1	3.784	250	.618
	EDUCATION LEVEL x GENDER	17.265	1	17.265	1.140	287
3-Way Interaction	TREATMENT x EDUCATION LEVEL x GENDER	9.638		9.638	637	426
Model		3968.168	8	496.021	32.761	000
Residual		2195.397	145	15.141		
Total		6163.565	153	40.285		

*Significant at p< 0.5

Table 4.1 shows that the main effect of treatment is significant on the variations of adult learners' environmental knowledge ($F_{(1,153)}$ = 209.303; P <0.05). Hence Ho_1 is rejected. This means that there is a significant difference in the environmental knowledge of adult learners in the participatory EE programme group and that of the control group.

Table 4.2: Multiple Classification Analysis of Knowledge Scores by Treatment, Education Level and Gender

Treatment + Category	N	Predicted Mean		Unadjusted Dev	Eta	Adjusted for Factors and Covariates	Beta
		Unadjusted	Adjusted for Factors and Covariates				
TREATMENT Participatory instruction Control	79 75	18.61 8.40	18.95 8.48	47.76 -5.01	.772	5.09 5.37	.826
EDUCATION LEVEL Low High	72 82	12.75 14.82	12.99 14.61	-1.10 97.6	.163	-86 76	.128
GENDER Male Female	87 67	14.00 13.66	13.93 13.75	15 -19.02	.027	7.523E-02 -9.77E-02	.014
R = .789 R Squared = .622							

From Table 4.2, learners exposed to the participatory EE instruction programme had higher environmental knowledge score ($\bar{x}$ = 18.95) than their counterparts in the control group ($\bar{x}$ = 8.48).

4.1.2 Hypothesis 1b: There is no significant main effect of the participatory Non-formal EE Programme on the Adult Learners' Environmental Attitude.

Table 4.3: Summary of ANCOVA of Post-Test Attitude by Treatment, Education Level and Gender

Source of Variance		Hierarchical Method				
		Sum of Squares	Df	Mean Square	F	Sig.
Covariates	PRE-ATTITUDE	220.247	1	220.247	1.585	210
Main Effects	(Combined)	15215.277	3	5071.759	36.500	000
	TREATMENT	14764.280	1	14764.280	106.253	000*
	EDUCATION LEVEL	42.408	1	42.408	305	581
	GENDER	408.590	1	408.590	2.940	089
2-Way Interactions	(Combined)	2274.410	1	758.137	5.456	001
	TREATMENT x EDUCATION LEVEL	1893.742	1	1893.742	13.629	000*
	TREATMENT x GENDER	8.173	1	8.173	059	809
	EDUCATION LEVEL x GENDER	319.160	1	319.160	2.297	132
3-Way Interaction	TREATMENT x EDUCATION LEVEL x GENDER	133.52	1	133.526	961	329
Model		17843.460	8	2230.433	16.502	000
Residual		20148.254	145	138.953		
Total		37991.714	153	248.31		

*Significant at $p < 0.05$

Table 4.3 shows that there is a significant effect of treatment on adult learners' environmental attitude ($F_{(1,153)} = 106.253$; $P < 0.05$). On this basis, hypothesis 1b is rejected. This means that the difference between the environmental attitude score of adult learners exposed to the participatory EE prograsmme and that of control group is significant.

Table 4.4: Multiple Classification Analysis of Post-Test Attitude by Treatment, Education Level and Gender

Treatment + Category		N	Predicted Mean		Unadjusted Dev	Eta	Adjusted for Factors and Covariates	Beta
			Unadjusted	Adjusted for Factors and Covariates				
TREATMENT	Participatory Instruction	79	68.99	69.10	9.56	.625	9.67	.632
	Control	75	49.36	49.24	-10.07		10.19	
EDUCATION LEVEL	Low	72	58.18	58.62	-1.25	.74	-81	.048
	High	82	60.52	60.14	1.09		.71	
GENDER	Male	87	57.87	57.98	-1.55	.113	-1.45	.105
	Female	67	61.45	31	2.02		1.88	
R = .637 R Squared = .406								

From table 4.4, the participatory instruction group obtained higher environmental attitude score ($\bar{x}$ = 69.10) than their control group counterparts ($\bar{x}$ = 49.24).

4.1.3 Hypothesis 1c: There is no significant main effect of the participatory Non-formal EE Programme on the Adult Learners' Environmental Practices.

Table 4.5: Summary of ANCOVA of Posttest Practices by Treatment, Education Level and Gender

Source of Variance		Hierarchical Method				
		Sum of Squares	Df	Mean Square	F	Sig.
Covariates	PRE-PRACTICE	73.121	1	73.121	.524	470
Main Effects	(Combined)	1037.551	3	345.850	2.477	064
	TREATMENT	751.952	1	751.952	5.386	022*
	EDUCATION LEVEL	268.675	1	268.675	1.924	167
	GENDER	16.923	1	16.923	.121	728
2-Way Interactions	(Combined)	998.792	3	332.931	2.385	072
	TREATMENT x EDUCATION LEVEL	145.363	1	145.363	1.041	309
	TREATMENT x GENDER	663.950	1	663.950	4.756	031
	EDUCATION LEVEL x GENDER	138.766	1	138.766	.994	320
3-Way Interaction	TREATMENT x EDUCATION LEVEL x GENDER	159.640	1	159.640	1.143	287
Model		2269.103	8	283.638	2.032	047
Residual		20243.520	145	139.610		
Total		22512.623	153	147.141		

*Significant of $p < 0.05$

From Table 4.5, there is a significant effect of treatment on adult learners' environmental practices ($F_{(1,153)} = 5.386$; $p<0.05$). Hypothesis 1c is therefore rejected. This implies that there is significant difference in the environmental practices of participants exposed to the treatment

Table 4.6: Multiple Classification Analysis of Post-Test Practices by Treatment, Education Level and Gender

Treatment + Category		N	Predicted Mean		Unadjusted	Eta	Adjusted for Factors and Covariates	Beta
			Unadjusted	Adjusted for Factors and Covariates				
TREATMENT	Participatory	79	63.56	63.60	2.17	.841	2.21	.188
	Instruction	75	59.11	59.06	-2.28		-2.33	
	Control							
EDUCATION LEVEL	Low	72	62.69	62.76	1.30	.101	1.37	.188
	High	82	60.24	60.19	1.15		-1.20	.028
GENDER	Male	87	60.86	61.09	-53		-29	
	Female	67	62.07	61.77	69.050	.050	.38	
R = .222 R Squared = .049								

Table 4.6 reveals that the participants in the participatory instruction group obtained higher environmental practices score ($\bar{x}$ = 63.60) than the control group ($\bar{x}$ = 59.06).

4.1.4 Hypothesis 2a:There is no significant main effect of education level on the Non-formal Adult Learners' Environmental knowledge.

Table 4.1 shows that education level has a significant effect on the participants' environmental knowledge ($F(1,153) = 6.802; P<0.05$). This means that there is a significant effect of education level on adult learners' environmental knowledge. Therefore, hypothesis 2a is rejected. Table 4.2 shows that participants in the high education level had higher environmental knowledge score ($\bar{x}$ = 14.61) than those in low education level ($\bar{x}$ = 12.99).

4.1.5Hypothesis 2b: There is no significant main effect of level of education on the Non-formal Adult Learners' Environmental Attitude.

Table 4.3 shows that there is no significant effect of education level on participants environmental attitude ($F_{(1,153)}=.305$; $p>0.05$). Hence hypothesis 2b is not ejected.

However, it is necessary to find the magnitude of the group performance. Table 4.4 reveals that those in higher education level obtained higher environmental attitude score ($\bar{x}$ = 60.14) than those lower education ($\bar{x}$ = 58.62).

4.1.6 Hypothesis 2c: There is no significant main effect of level of education on the Non-formal Adult Learners' Environmental Practices.

Table 4.5 shows that there is a significant effect of education level on participants' environmental practices ($F_{(1,153)}$=1.924; p<0.05). Hence, hypothesis 2c is rejected. However, Table 4.6 shows that adult learners in lower education level had higher environmental practices scores ($\bar{x}$ = 62.76) than those in the higher education level ($\bar{x}$ = 60.29).

4.1.7 Hypothesis 3a: There is no significant main effect of gender on the Non-formal Adult Learners' Environmental Knowledge.

From Table 4.1, gender has no significant effect on adult learners environmental knowledge ($F_{(1,153)}$ = 073; p>0.05). Hypothesis 3a is therefore not rejected. Table 4.2 shows that on environmental knowledge, males obtained higher mean score ($\bar{x}$ = 13.93) than their female counterparts ($\bar{x}$ = 13.75).

4.1.8 Hypothesis 3b: There is no significant main effect of gender on the Non-formal Adult Learners' Environmental Attitude.

It is obtained from Table 4.3 that the effect of gender on participants environmental attitude is not significant ($F_{(1,153)}$ = 2.940, p>0.05). Hence Ho3b is not rejected. The Magnitude scores on Table 4.4 shows that the female learners obtained higher environmental attitude scores ($\bar{x}$ = 61.31) than their male counterparts ($\bar{x}$ = 57.98).

4.1.9 Hypothesis 3c: There is no significant main effect of gender on the Non-formal Adult Learners' Environmental Practice.

From Table 4.5, there is no significant effect of gender on participants' environmental practices ($F_{(1,153)}$=.121;p>0.05). Hence, hypothesis 3c is not rejected. Table 4.6 further shows that the female adult learners obtained slightly higher environmental practices score ($\bar{x}$ = 61.09).

4.1.10 Hypothesis 4a: There is no significant interaction effect of the Participatory Non-formal EE Instructional Programme and level of education on the adult learners' Environmental knowledge.

From Table 4.1, there is a significant interaction effect of treatment and level of education on adult learners environmental knowledge ($F_{(1,153)}$=6.385.p< .05). Ho 4a is hereby rejected. In order to explain the nature of this interaction, figure 4.1 is presented:

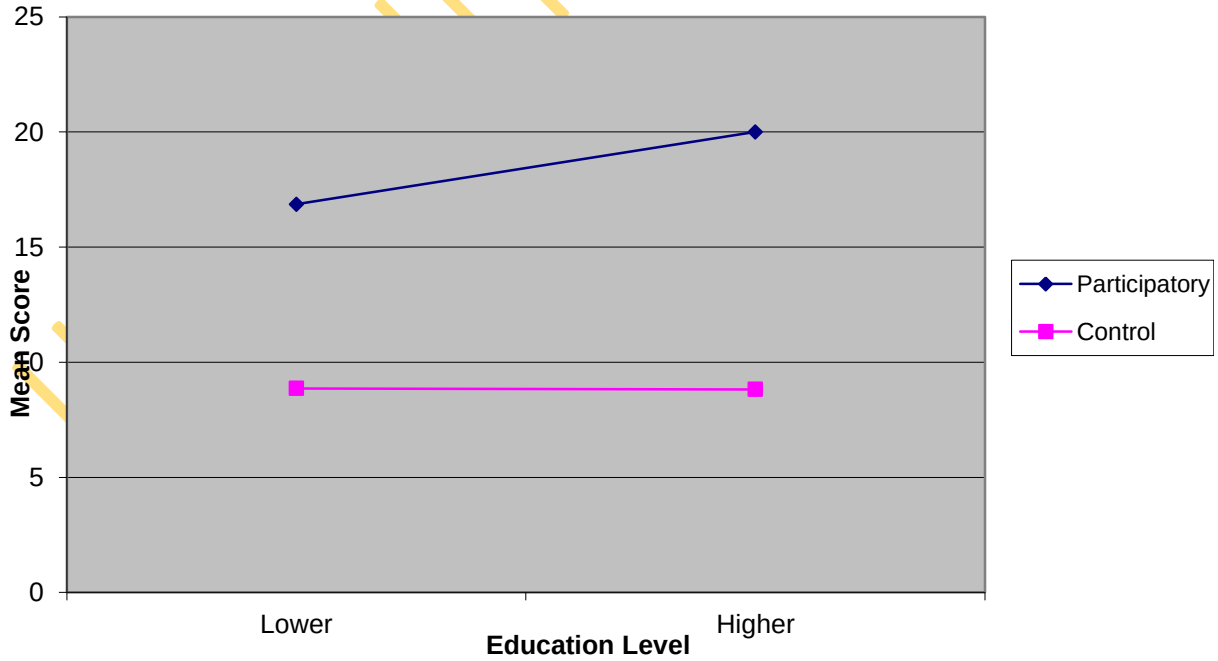

Figure 4.1: Interaction Effect of Treatment and Education level on Environmental Knowledge

Figure 4.1 shows that among the participants in the low education level, the participatory instruction was more effective than the conventional instruction. In the same vein, the participatory instructional programme was more effective than the conventional instruction for the learners in high education level.

4.1.11 Hypothesis 4b: There is no significant interaction effect of the Participatory Non-formal EE Instructional Programme and education level on the adult learners' Environmental Attitude.

Table 4.3 shows that the interaction effect of treatment and education level is significant on participants environmental attitude ($F_{(1,153)}$=13.629;p< 0.05). On this basis, hypothesis 4b is rejected. Figure 4.2 explains this interaction.

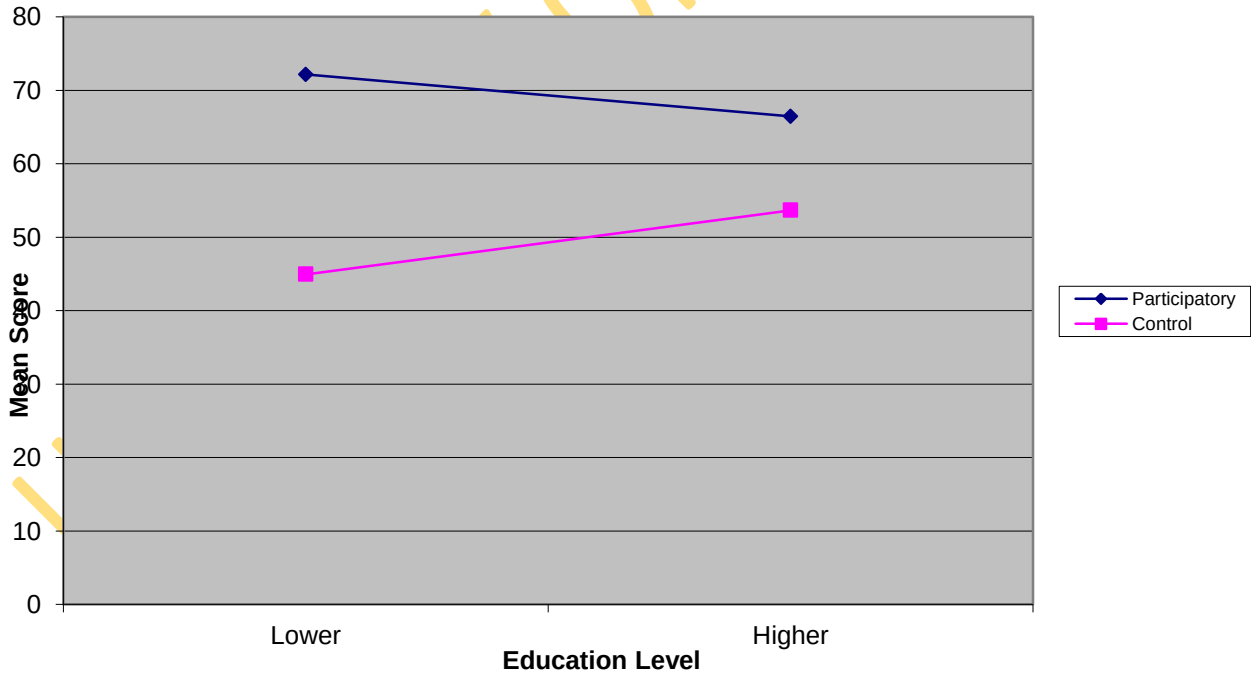

Figure 4.2: Interaction Effect of Treatment and Education Level on Environmental Attitude

Figure 4.2 shows that the participatory instructional programme was more effective for the adult learners in both the low and the high education levels than the conventional instructional method.

4.1.12 Hypothesis 4c: There is no significant interaction effect of the Participatory Non-formal EE Programme an education level on the adult learners' Environmenta Practices.

Table 4.5 shows that there is no significant interaction effect of treatment and education level on Adult learners' environmental practices ($F_{(1,153)}$1.041; p>0.05). This finding necessitates the non rejection of hypothesis 4c.

4.1.13 Hypothesis 5a: There is no significant interaction effect of the Participatory Non-formal EE Programme and gender on adult learners' environmental knowledge.

Table 4.1 shows that the interaction effect of treatment and gender is not significant on adult learners environmental knowledge ($F_{(1,153)}$=0.250;p>0.05). Hence, hypothesis 5a is not rejected.

4.1.14 Hypothesis 5b: There is no significant interaction effect of the Participatory Non-formal EE Programme and gender on adult learners' environmental Attitude.

Table 4.3 shows that the interaction effect of treatment and gender on adult learners' environmental attitude is not significant ($F_{(1,153)}$=.59;p>0.05). Therefore, hypothesis 5b is not rejected.

4.1.15 Hypothesis 5c: There is no significant interaction effect of the Participatory Non formal EE Programme and gender on adult learners' environmental Practices.

From Table 4.5, there is a significant interaction effect of treatment and gender on adult learners' environment. Practices ($F_{(1,153)}$) =4.756, $p<0.05$). Hypothesis 5c is hereby rejected. Figure 4.3 explains the nature of this interaction.

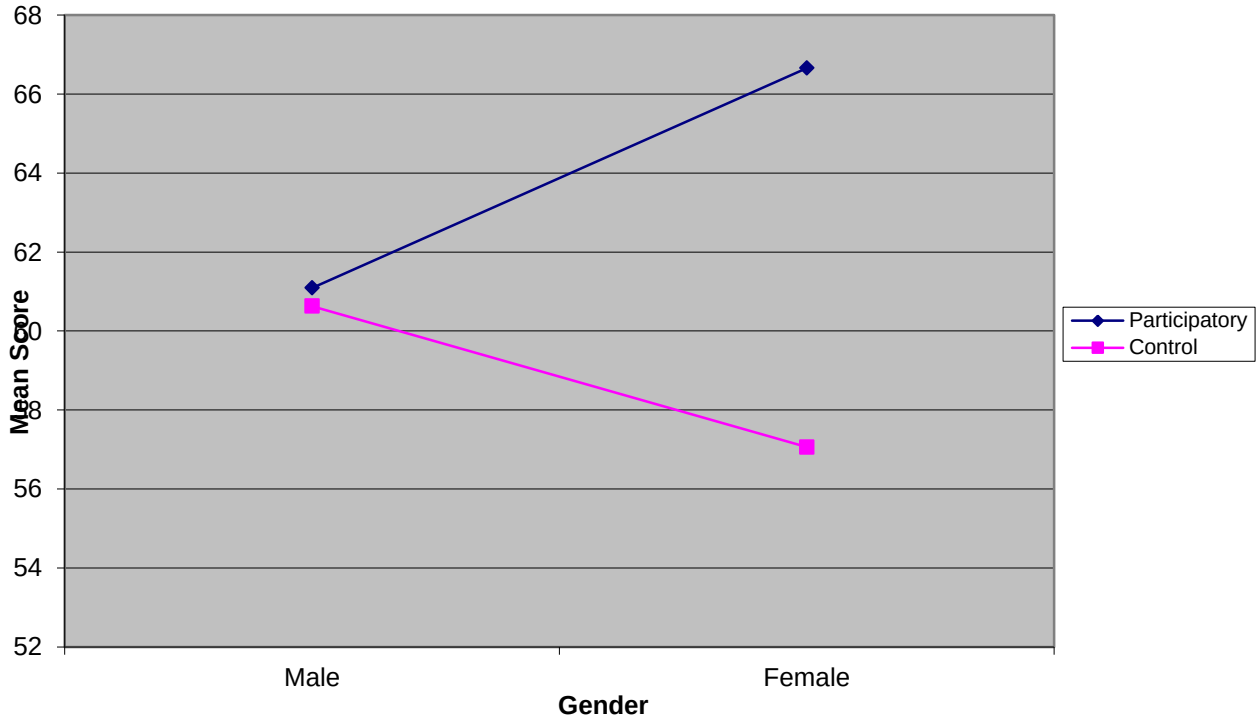

Figure 4.3: Interaction Effect of Treatment and Gender on Environmental Practices.

Figure 4.3 shows that for both males and females, the participatory instructional programme proved more effective than the conventional instruction. This is an ordinal interaction.

4.1.16 Hypothesis 6a: There is no interaction effect education level and gender on the adult learners' environmental knowledge.

From Table 4.1, there is no significant interaction effect of education level and gender on environmental knowledge ($F_{(1,153)}$=1.140; $p>0.05$). Hence, hypothesis 6a is not rejected

4.1.17 Hypothesis 6b: There is no interaction effect of education level and gender, on the adult learners' environmental attitude.

Table 4.3 shows that the interaction effect of education level and gender on the adult learners' environmental attitude is not significant ($F_{(1,153)}$=2.297;p>0.05). Hypothesis 6b is not rejected.

4.1.18 Hypothesis 6c: There is no interaction effect of education level and gender, on the adult learners' environmental Practices.

From Table 4.5, there is no significant interaction effect of education level and gender on adult learners environment attitude ($F_{(1.153)}$=-994;p>0.05). This finding leads to the non rejection of hypotheses 6c.

4.1.19 Hypothesis 7a: There is no significant interaction effect of the Participatory Non formal EE Programme, education level and gender on the adult learners' environmental knowledge.

From Table 4.1, there is no significant interaction effect of treatment, education level and gender on the adult learners' environmental knowledge ($F_{(1,153)}$=.637,;p> 0.05). Hence, hypothesis 7a is not rejected.

4.1.20 Hypothesis 7b: There is no significant interaction effect of the Participatory Non- formal EE Programme education level and gender on the adult learners' environmental attitude.

Table 4.3 shows that the interaction effect of treatment, education level and gender on environmental attitude is not significant ($F_{(1,153)}$=.961; p>0.05). Hypothesis 7b is therefore not rejected.

4.1.21 Hypothesis 7c: There is no significant interaction effect of the Participatory Non-formal EE programme, education level and gender on the adult learners environmental practices. From Table 4.5, the 3-way interaction effect of treatment, education level and gender is not significant ($F_{(1,153)}$ 1.143;$p>0.05$). Hence, hypothesis 7c is not rejected.

4.2 Summary of Findings

Findings of the study are summarized as follows:

(1) There was a significant difference in the environmental knowledge, attitudes and practices of the adult learners exposed to the participatory EE programme and those in the control group. The mean scores showed a gain in the scores of the adult learners in the post-test over their pre-test scores.

(2) There was a significant effect of adult learners' education level on their environmental knowledge. This means that the difference between environmental knowledge scores of the adult learners exposed to the participatory EE programme and those in the control group is significant. However, education level did not have any significant effect on the participants' environmental attitude and practices. It was further revealed from the magnitude of group performance that those in high education level in the study obtained higher environmental attitude scores than those in the low level. Those in low education level obtained higher environmental practices scores than those in the high education level.

(3) There was no significant main effect of gender on the participants' environmental knowledge, attitude and practices. Males obtained higher mean scores than the females in both environmental attitude and environmental practices questionnaire.

(4) There was significant interaction effect of participatory EE programme and education level on adult learners' environmental knowledge and attitude but not on the environmental practices.

(5) There was no significant interaction effect of treatment and gender on adult learners' environmental knowledge and environmental attitude. However, the interaction effect was significant on participants' environmental practices.

(6) There was no significant interaction effect of education level and gender on adult learners' environmental knowledge, environmental attitude as well as environmental practices.

(7) The 3-way interaction effect of treatment, education level and gender was not significant on each of the three dependent variables

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter presents the discussion, conclusion and the recommendations made based on the findings of the study.

5.1 DISCUSSION

5.1.1 Participatory Non-formal EE Programme and the Adult Learners' Environmental Knowledge

The findings of the study revealed that the adult learners in the participatory EE programme group performed better than their counterparts in the control group in environmental knowledge. This result suggests that the participatory progrmme effectively impacted the environmental knowledge of adult learners exposed to it.

This superior performance of the adults involved in the participatory instruction over those in the conventional lecture may be attributed to the nature of the participatory EE programme developed and implemented in the course of the study in which the learners were allowed the freedom to engage in various learning activities in a democratized learning atmosphere. This enabled them to construct their own knowledge of the concepts selected for the study as they individually or in their groups generated, distinguished, linked and compared ideas. They also had opportunities to recall facts, observe, collect and group objects and resources in the environment as well as defined, explained and debated on issues. They also evaluated, summarized and drew conclusions on the lessons all by themselves with minimal teacher interference. These

real life activities must have enormously influenced and as such impacted their environmental knowledge.

Furthermore, the participation of the experimental group in activities which led to decision-making on what to present to the entire members of the class involved a lot of critical thinking and evaluation of each other's input. Similarly the variety of ideas and views presented by the groups to the entire class generated a wider scope of information in relation to the concepts learnt as well as improved their vocabulary on EE concepts. The input by the members of the class as they made a critique of the group presentations provided an on-the-spot feedback on learners' performance. This at the end of the day and with the aid of the facilitator produced a summary and conclusion for the lessons as a product of everyone's effort.

This finding is related to the findings of Ajiboye and Ajitoni (2008) in which the secondary school students exposed to the participatory modes of instruction scored significantly higher in the environmental knowledge test than those in the control group. Ajiboye and Silo's (2008) study on Botswana primary school pupils also reported a significantly high environmental knowledge of those exposed to their participatory programme. In the same vein, in Mansaray and Ajiboye's (2000) study, students exposed to participatory modes in an informal Civics Education performed significantly higher than those in the control group. These are in line with the views of Robert (2010) that people would develop strong environmental knowledge and capacity for positive environmental change when it is contextualized or taught using real examples with active-learner-participation.

5.1.2 Participatory Non-formal EE Programme and Adult learners' Environmental Attitude

The findings of this study in respect to environmental attitude revealed that the adult learners in the participatory instruction group acquired more positive environmental attitude than those in the control group. The superiority of the participatory group's performance over the control group in acquisition of environmental attitude may not be unconnected with the fact that those exposed to the participatory programme engaged in various fun creating activities, team work and group activities which must have instilled in them a great deal of concern for the environment hence the resultant significant positive change in their attitudes towards the environment.

The placement into the small groups which was strictly randomly effected brought the adults of varying learning styles, capabilities, experiences and dispositions to work together to produce a decision that they believed would best represent their group work. This involved a lot of cooperation, respect for each other's ideas and views, leadership roles, adherence to laws, rules and regulations governing the activities which must have aided in instilling positive attitude in the learners towards the environment. The active learner participation approach as demonstrated in the present EE programme also provided a platform for evaluating the learners on the affective domain as well served as an effective way of taking care of individual differences in the adult learners. The more positive attitude demonstrated by participants in the participatory group than those in the control bears resemblance with the findings of Olagunju (1998), Ajiboye and Ajitoni (2008); Ajiboye and Silo (2008).

5.1.3 Participatory Non-formal EE Programme and Adult Learners' Environmental Practices

This study revealed higher environmental practices for the adult learners exposed to the participatory EE programme than those in the conventional lecture method. This implies that those in the participatory group acquired better environmental practices than their counterparts in the control group. This is likely to be as a result of the nature of the participatory programme developed and implemented in the study which emphasized active learner participation.

The various learning activities as the name of the programme implies involved the manipulative skills of touching, gathering and collecting real objects/resources, writing, drawing, fun creating demonstrations in form of singing, miming, dancing, clapping as well as assuming different roles including those of time-keepers, recorders, group leaders, group representatives which engaged the adults in real life activities in relation to the environment and at the same time highlighted environmental friendly practices that meet the requirements of sustainable economic development.

This corroborates the findings of Adhikarya (1998), Madumere (2000), UNESCO (2001), Mahanty (2003), UNESCO (2004), Ngothor, Fincham and Quinn (2004) and WWF(2008) who reported significantly high environmental practices of adults exposed to their non-formal participatory EE programmes.

5.1.4 Education Level and Adult Learners' Environmental Knowledge, Attitude and Pratices

It was discovered from the findings of this study that the environmental knowledge of the adult learners in the high education level, both in the treatment and control groups, were significantly higher than those in the low education level. However, the mean scores of their environmental attitude and environmental practices

did not reveal any significant differences. This implies that high education level significantly influenced the participants' environmental knowledge.

This could be attributed to the fact that those in the high education level, who due to their anticipated gain in the number of years already spent in the adult literacy centres, may have acquired better command of the English Language which constituted the language of instruction\interactions for the present participatory EE programme. More so, in most of the adult learners' previous teaching\learning settings, the cognitive aspects which are basically at the knowledge level are usually better handled through verbal presentations which is predominant in the conventional lecture methods (Umoh, 1995). Thus the more number of years already spent in the adult literacy centres by the participants in the high education level may have exposed them to higher performance in English language. Hence, their corresponding gain on environmental knowledge acquisition over those in the low education level.

Secondly the superior performance in the environmental knowledge of the learners in the high education level could also be traced to the fact that EE concepts are basically cross-curricular and interdisciplinary in nature. As such the opportunity of having been exposed to more courses and concepts may have also placed those in high education level at a more advantageous position of higher environmental knowledge achievement than those in the low education level. This finding is in line with the result of Ncharam and Bissong's (2007) study in which adults in high education level obtained higher environmental knowledge scores than those in the low level.

5.1.5 Gender and Adult Learners' Environmental Knowledge, Attitude and Practices

The result of the findings of this study revealed that gender did not have any significant influence on the adult learners' environmental knowledge, attitude and practices. Though the males performed better than the females in their environmental attitude and practices, the differences were found to be insignificant.

This implies that the Non-formal Participatory EE Programme had about an equal effect on both male and female adult learners in the study. This could be attributed to the fact that this EE progamme tend to contain essential elements that could enhance both male and female learning outcomes. Hence it provided equal learning opportunities for all the adult learners in the study regardless of gender differences.

5.1.6 Interaction Effects of Participatory Non-formal EE Programme and Education level on the adult learners' Environmental knowledge, attitude and practices.

The result obtained from the study shows that there is a significant interaction effect of the participatory programme and education level on adult learners' environmental knowledge. In other words, the influence of the present participatory programme differed upon the education levels of participants in their environmental knowledge achievement. Those in the high education level had higher environmental knowledge than those in the low level. This means that even though this EE programme was effective in impacting the adult learners' environmental knowledge, its use in the present study may have been a function of whether they were in the high or low education levels.

The findings of the study also revealed that there is a significant interaction effect of the participatory non-formal EE programme and education level on adult learners' environmental attitude. Those in the high education level had more positive environmental attitude than their counterparts in the low education level. This means that the use of this EE programme depended on which level of adult learners (high or low education level) it is meant for. Thus the mode of acquiring environmental attitudes by adult learners can be education level sensitive. This can also be attributed to the fact that being in the high education level increased their opportunity of being exposed to more number of school subjects which may have entailed more learning and higher intellectual capabilities too which in turn may have made it easier for attitudinal modification and positive changes. However, from the result of the study the interaction effect of the participatory EE programme and education level on adult learners' environmental practices was not significant.

5.3 Conclusion

The quality of the environment depends critically on the level of knowledge, attitude, values and practices of human beings in the society. For the obvious reason that those outside the formal school system constitute the larger percentage of the people who degrade the environment most, it may be very necessary that current directions in EE should accord priority to educating the adults in the non-formal sector. The high level performance of the adults exposed to the Participatory Non-formal EE programme developed and used in the present study is part of the indications that the environmental knowledge, attitude and practices of such group of people could be more effectively impacted by EE programmes that allow them the freedom to actively participate in lessons in democratized learning settings than in the usual non-participatory, one- directional or teacher directed approaches.

Moreover, with the current global decade for Education for Sustainable Development which terminates by 2015 and the Nigerian vision to be one of the twenty top world economies by the year 2020, it will be improper for us to wait for the children who are currently in schools to grow to begin to implement the principles of sustainable economic development which is not just the basic requirement for becoming a world economy but, has EE as the basic tool for its attainment. Hence it has become a matter of urgency that Participatory Non-formal EE programmes be adopted so as to ensure a more effective and high percentage coverage of the Nigerian populace. This study which was motivated by the concern for the terrific level of deterioration on our environment will serve as an attempt to adequately target the adults who constitute the larger percentage of Nigerian population that degrade the environment most with EE

progammes that involve them actively in finding solutions to the problems they play major roles in generating.

5.4 Recommendations

Based on the findings of this study the following recommendations are made:

1. Adult learners should be exposed to Participatory Non-formal EE Programmes during which they would be given the opportunity to actively participate in developing their skills, create sense of commitment and stimulate individual and collective actions towards the environment.

2. Adult educators should be trained in the development and use of Participatory EE Programmes through capacity building workshop series.

3. Curriculum experts in EE and Adult Education should collaborate to ensure adequate utilization of Participatory EE Programmes for the adults both in the Literacy Centres and other settings such as the workplace, religious organizations, vocational centres and the trade unions.

4. Nigerian Government via the Federal Ministry of Environment and other related parastetals should adopt the Participatory Non-formal EE Programmes to urgument the efforts so far made through Non-participatory programmes.

5. The issue of mass literacy should be taken more seriously since high Education Level tends to enhance learning in EE.

6. Increased effort by environmental educators should be directed towards impacting women's environmental outcomes since they have been identified as those closest to environment, environmental managers and the group of people most vulnerable to

environmental hazards who however tend to be ignorant of the implications of their actions.

5.5 Limitations to the Study

In the course of this study, it was discovered that certain factors may limit the generalisability of the findings of this study. This include that the present study was conducted in only Oyo state. There is need to replicate this study in other states of the federation. Time limit was another constraint since the lesson periods in the Adult Non-formal Literacy Centres was between 3.30 and 6.30 pm which restricted the learners to only three hours of two lessons daily.

5.6 Suggestions for further Studies

Based on the findings of this study, the following suggestions are made for further studies:

1. This study should be replicated in the other states in Nigeria on a wider scope to further determine the impact of Participatory Non-formal Environmental Education Programme on the adult learners" environmental outcomes.
2. Also the extent of the influence of gender on the adult learners' environmental knowledge, attitude and practices should be further investigated.
3. Further studies should be conducted on the influence of education level on the adult learners' environmental knowledge, attitude and practices.

REFERENCES

Adara, O.A. 1992. Environmental Education Aspects of Schools Subjects: A Guide to Curriculum Developers: A Seminar Paper Presented at CDC, NERDC, Sheda-Abuja.

Adebayo A. & Olawepo J.A. 1998. Injecting Elements into the Social Studies Curriculum for Junior Secondary Schools in Nigeria. *Environmental Education Research.*

Adebimpe, R.U. 2011 Climate Change Related Disaster and Vulnerability: An Appraisal of the Nigerian Policy on Environment. *Environmental Research Journal* 5(3) 97-103.

Adhikarya, R. 1998. EE Training: Best Practices and Lessons Learned from Experiences in Six Asian Countries. Economic Development Institute of World Bank. Washington DC.

Aghoolor, R.N. 1993. Environmental Education in the Non-Formal Sector. *Proceedings of National Conference on EE*. Nigerian Conservation Foundation. Lagos.

Ahove, M.A.N. 1999. *Basic Environmental Education and Management*. Lagos: Ziglag Education Publishers.

Ahove, M.A.N. 2007. Students Perception, Attitude and Practical steps taken towards Sustainable Development of the Environment.

Ajewole, G.A. 1991. Effects of Discovery and Expository Instructional Methods on Attitude of Students in Biology. *Journal of science Teaching*. 28(5): 401-419.

Ajiboye, J.O. & Ajitoni, S.O. 2008. Effects of full and quasi-participatory learning strategies on Nigerian senior secondary students' environmental knowledge: Implications for classroom practice. *International journal of environment and science education* 3(2), 58-66.

Ajiboye, J.O. & Silo, N. 2008. Enhancing Botswana Children's Environmental Knowledge, Attitude and Practices through the School Civic Club. *International Journal of Environmental and Science Education* 3(3) 105-114.

Ajitoni, S.O. 2005. Effects of Full and Quasi-Participatory Learning Strategies on Senior Secondary School Students' Environmental Knowledge and Attitude in Kwara State, Nigeria. Ph.D Thesis. Department of Teacher Education. University of Ibadan. Disertation.

Anderson C. 1984. *Strategic Teaching and Learning: Cognitive Instruction in the Content Areas*. Alexandria V.A: Association for Supervision and Curriculum Development.

Anyakoha, E.U. 1999. Women and Environmental Awareness. *International Journal of Women's Studies*. 1(2). 28-35.

Arcury, T.A. & John, T.P. 1987. Public Environmental Knowledge. A Statewide Survey. *Journal of Environmental Education.* 18(4), 31-37.

Athman, J. A. & Monroe, M. C. 2000. *Elements of Effective Environmental Education Programmes*: A Publication of the School of Forest Resources and Conservation, University of Florida.

Ausbel, D., Navak, J. & Hanesian H. 1978. Education Psychology: A Cognitive View (2nd edition.). New York: Holt Rinehart and Winston.

Bamidele, Y. 2011. Ibadan Still Trembles from Shocking Ocean-wave like Flood Disaster. *Sunday Trust*. Sept. 4th: 1.

Bowyer, I. 1990. Scientific and Technological Literacy. Education for change. UNESCO World Conference on Education for All.

Broadcasting Corporation of Abia (BCA), 2006. A News Commentary.

Brody, M. 1996. An Assessment of Thailand 4th, 8th and 10th Grade Students' Knowledge Related to Marine Science and Natural Resource Issues. *Journal of Environmental Education. 27(3), 21-27.*

Bruner, J.S. 1960. *The Process of Education*. Cambridge: Harvard University Press.

Brunner, J.S.1966. *Towards a Theory of instruction.* Cambridge: Harvard University Press.

Brunner, J.S.1974. The Process of Education Revised. In W. VanTill (Ed). *Curriculum: Quest for Relevance*. Boston: Houghton Mifflin Company.

Chimaka C.C. 2008. Sustainable Agricultural Development: The Role of Co-operative Societies. National Agricultural Extension and Research Liason Services. Ahmadu Bello University, Zaria.

Clover, D. 1998. Environmental Adult Education in Canada: Growing Jobs for Living. *Australian Journal of Environmental Evaluation*. Vol. 114-116.

Coben, I. 1993. *Green Fir*e, Sydney: Harper Collins Publishers.

Coombs, P. H; Prosser, C. & Ahmed M. 1973. *Non-formal Education in Encyclopedia of Informal Education*, New York.

Cunningham, W. P., & Cunningham, M. A, 2002, *Principles of Environmental Sciences*, Boston: McGraw Hill.

Desinger J. 1993. *Environment in the K – 12 Curriculum: An Overview*. NY: Krause International Publication.

Desinger, J. & Monroe, M. 1994. *Defining Environmental Education: EE Toolbox – Workshop Resource Manual*. Dubuque: Kendall/Hunt Publishing Company.

Dike N. 2001. Towards Enhancing Environmental Education for the Nigerian Women: The Role of Women in STM. *Science Teachers Association of Nigeria.* 172-276.

Disihger, J. 1983. Environmental Education Definitional Problem. *ERIC Information Bulletin* (2). ERIC: Ohio.

Dokun, J.I. 1999. Impact of Lagos State Environmental Sanitation Campaign on Market Woman's Environmental Knowledge and Attitude to Waste Disposal. An M.Sc. Environmental Education Postgraduate Research Project Reports in Lagos State University, Centre for Environmental and Science Education Annual Report. 49.

EETAP, 1999. Environmental Education and Social Studies: Making the connection. EETA Resource Library: advancing Education and Environmental Literacy. 52.

Eguabor, V.O. 2001. Women Cultural Issues and the Environment in FCT: A Survey. *Science Teachers Association of Nigeria.*164-167.

Eliot, J. 1994. An Introduction to SD: The Development World. London: Routledge.

Environmental Education and Training Partnership (EETAP) 1998. *EETAP Resource Library.* Assessing Non formal Environmental Education unobtrusive data collection. EETAP 1 and 2.

Etuonovbe, A.K. 2009. The Devastating Effects of Environmental Degradation: A Case Study of the Niger Delta Region of Nigeria. *Environment and Land Use Planning.* Working Weeking 2009. Eliat Israel. May 3-8: 1-14.

Eugene, E.E. 2004. Threats to Sustainable Forestry Development in Oyo State, Nigeria. M.Sc Dissertation, Swedish University of Agricultural Sciences.

Eyes, V.S. 1976. A survey of the environmental knowledge and attitude of the fifth year pupils in England. Doctoral Thesis, Ohio State University.

Federal Environmental Protection Agency (FEPA), 1995. *A Corporate Profile of the FEPA*. Lagos: Wishbone-s.

Federal Ministry of Environment (FME) 2000. Ministerial Press Briefing: Nigeria Through the Ages-Protecting our Environment and Natural Resources. By the Honourable Minister of Environment. 7th February.

Fien, J. 1999. Promoting Education for Sustainable Future Approaches to Regional Co-operation in Asia and the Pacific. Proceeding of the International Conference on Environmental Education in the Asia-Pacific Region. Japan.

Filho, W.L. & Palmer, J.A.1992. *Key issues in Environmental Education*. England: The Horton Print Group. For relevance, Boston: Houghton Mifflin Company.

Gbamaja, S.P.T. 1998. Keynote address on STAN Environmental Education Conference.

Gigliotti L. 1990. Environmental Education: What Went Wrong? What can be done? *Journal of Environmental Education. 11(2), 9-12.*

GreanHeart Edcation. 2008. Learning Enticements to Sustainability and Environmental Action. *Greening the Curricula.*

Guevara, Flowers & Griffits 2006. Popular and Informal Environmental Education: The need for more research in an emerging field of practice. Australian Journal of Environmental Education.

Gyallay – Pap, P. 1994. *Environmental Education Environmental Technical Advisory Programme (ETAP) Reference Guide Book.*

Heinlich, J. E. 1993. Non-formal Environmental Education: Toward a Working Definition. *Science, Mathematics and Environmental Education Bulletin*.

Ikwuazom, A. C. 1997. *Man in His Environment: An Overview of Social Studies*. Nigeria: Tony Printers.

Imhonlele, 2007. Nigerian Conservation Foundation (NCF) and the Challenges of Cleaner Environment. *Business Day*. Lagos.

Inyang – Abia M.E & Umoren G.U. 1994. *Introduction to Environmental Education Curriculum Concept in Curriculum Development and Evaluation in Environmental Education*: Nigerian Conservation Foundation Module V. Nigeria Macmillian Publishers Ltd.

Inyang- Abia, M.E.1994. Environmental Education Curriculum design Model. In Inyang-Abia, Abia A.E &Umoren, C.U (ed) *Curriculum Development and Evaluation in Environmental Education*. Nigerian Conservation Foundations Module Vol. 1, Nigeria: Macmillian Publishers Ltd.

Jibunoh, N. 2008. Essence. *Sunday Punch* July 6.

Johnson I.D. 2003. Sustainable Development Learning as Enticement to Environmental Action, Unpublished Master's Thesis, Antgonish, NS: St. Fracis Xavier University.

Johnson, D.W. & Johnson, R.T. 1999. *Making Cooperative Learning Work. Theory Into Practice*. 38(2) 67 – 73.

Knapp, D. 2000. The Thessaloniki Declaration: A Wake-up Call for the Environment. *The Journal of Environmental Education.* 30(3), 33-39.

Kola-Olusanya, A. 2000. Environmental Education in Nigeria: A look beyond the Infusion problem. Ontario Institute for Studies in Education of the University of Toronto.

Lakshmi, E.V.A. & Hee, S.C. 2005. Activity Based Teaching for Effective Learning. Paper presented at the Teacher World Conference.

Lozzi, L.A. 1989. What Research says to the Education part one: Environmental Education and the Affective Domain. *Journal of Environmental Education.* 20(3), 3-9.

LTP – Subproject, 2005. Environmental Education for Sustainable Development: A Research Proposal.

Madumere A.J. 2000. Environmental Programmes as Indispensable tool for Enriching Public Environmental Education in Nigeria. *Proceedings of the 1st Annual Conference of Science Teachers Association of Nigeria. Nigeria:* HEBN Publishers Plc.

Mahanty, B. 2003. Doing it and Telling it. *Connect* 28 (1, 2).

Mansaray, A.1999. A Community-Based Participatory Population Education Programme for African Inner-City: Focus on Ibadan.

Mansaray A. & Ajiboye J. O. 1997. Environmental Education and Nigerian Students' Knowledge Attitude and Practice (KAP): Implications for Curriculum Development *Environmental Education and Information*. 16(3).

Mansaray, A. Ajiboye, J. O. & Audu, U. F. 1998. Environmental Knowledge and Attitude of some Nigerian Secondary School Teachers *Environmental Education Research* 4(3). 329-339.

Mansaray, A. & Ajiboye, J.O. 2000. Developing a Participatory Model in Informal Civics Education for Secondary School Pupils in the Rural and Peri-Urban Areas of Nigeria. *Technical Report on a Project Undertaken by the University of Ibadan Social and Behavioural Research Group.*

Menzies, M. 1997. Summary of Katherine Kersten's Commentary. *EE Pulse Points: The Official Journal of MAEE.* 3.

Ministry of Environment, Warsaw, Poland. 2001 Through Education to Sustainable Development: National Environmental Education Strategy.

Minosota Office of Environmental Education 1993, Outcomes from Environmental Education Greenprints for Minosota.

Mkpa, A .M. 2003. *Learner-Centered Teaching Methods for Successful Universal Basic Education in Nigeria.* Owerri: Botz Publishing Company.

Mkpa, M.A.2001. Capabilities of the Centre for Primary and Non-formal Education, Abia State University, A Proposal.

Mordock K. and Kransy, M.E. 2001. Participatory Action Research: A Theoretical and Practical Framework for Environmental Education. *Journal of Environmental Education.* 32(3) 15-20.

National Environmental Education and Training Foundation (NEETF), 1997. Environmental Educational Science-Based, Balanced and Effective. Washington D.C.

National Institute for Educational Development (NIED). How Learner-Centered Are You? Okahandja Namibia. Ministry of Basic Education and Culture.

National Teachers' Institute (NTI) 2006. *Manual for the Re-training of Primary School Teachers*: Improvisation of instructional materials. Kaduna: NTI. 10.

Ncharam, S. E. and Bisong, C. K. 2007. Sustaining Environmental Sanitation Through Adequate Waste Disposal Methods to Eradicate Land Pollution Menace in Calabar South L.G.A of Cross River State. *Proceedings of the 50th Anniversary Conference of the Science Teachers Association of Nigeria (STAN)*. U. Nzewi (Ed). Nigeria: HEBN Publishers. 122-125.

Ngothor, M. Fincham R. & Quinn N. 2004. Government, Business and Public: The Role of EE in Creating Sustainable Urban Places. *EE Research* 10(3) August P. 318-319.

Noibi, A. S. 1993 Environmental Education for Sustainable Development. Environmental Education Workshop and Seminar Proceedings Vol. 2 .

North American Association for Environmental Education (NAAEE) 1997. Environmental Education Materials: Guidelines for Excellence. NAAEE Publication Office, Troy OH.

NAAEE, 2004. Non-formal Environmental Programmes: Guidelines for Excellent. Washington D.C. USA.

Nwokeabia, O.D. 2008. Land Degradation. Paper presented at the capacity Building Course for the staff of NESREA, Abuja.

Nzewi, U.M. 1998. Review Strategies for Teaching Water Pollution. Environmental Education Series No. 1. 30-39.

Nzewi, U.M. 2001. The Nigerian Woman as an Environmental Manager. *42nd Annual Conference Proceedings of the Science Teachers Association of Nigeria*. 168-173.

Odunaike, R. K., Laoye, T. K., Alausa, S. K., Ijeoma, G. C. & Adeleja, A. D. 2009. Science Alert: Radiation Emission Characteristics of Waste Dumpsites in the Cities of Oyo State of Nigeria. Toxicol. 2: 100-103.

Ogunleye. 2002. Evaluation of the Environmental Aspect of Senior Secondary school Chemistry Curriculum in Ibadan. Nigeria. Unpublished Ph.D Thesis Department of Teacher Education University of Ibadan.

Okeke, E.A.C. 2004. Environment and Development in Coastal Regions and in Small Islands: Education and Sustainable Coastal Development. University of Nigeria, Nsukka.

Olagunju, A.M. 1998. Environmental Education in Senior Secondary School Biology Curriculum for Improved Performance, Problem-Solving and Environmental Attitude. Unpublished Ph.D Thesis. Department of Teacher Education, University of Ibadan, Ibadan.

Olagunju, A.M. 2002. Fundamentals of Environmental Education: The Biosphere, Hydrosphere, Lithosphere and Atmosphere Pollution, Oil Spillage, Desertification and Soil Erosion. A Monograph.

Olori, T. 2002. Nigerian Floods/Erosion Devastate Villages. *Afro News Nigeria*. 1-2.

Olosunde, G.R. 2006. Impact of constructivist Model-based training programmes on pre-service teaching knowledge, classroom practice and student's learning outcomes in junior secondary Mathematics. An unpublished P.hD thesis, faculty of Education, University of Ibadan. Nigeria.

Opara, E. E. 1995. *Environmental Awareness Manual Nigerian Environmental Study/Action (NEST)* Ibadan: Friedrich Ebert Foundation Lagos.

Oyetade. 2003. Development of a Participatory Environmental Education Programme for College of Education Student in Lagos State, Nigeria. Unpublished Ph.D Thesis. Department of Teacher Education University of Ibadan.

Petters, S. W. 1995. Rationale, Nature and Scope of Environmental Education. *Nigeria Conservation Foundation Module 1*. Nigeria: Macmillan Publishers Ltd.

Petters, S.W. 1993. Environmental Problems and the Challenges of Environmental Education in Nigeria. Keynote Address Presented at *First National Conference on Environmental Education Proceedings*. 17-19 March. 10-24.

Romiszowski, A.J. 1988. *The selection and use of Instructional media* : *for improved classroom teaching in developing countries*. Paris: UNESCO.

Romtree, D. 1974. *Education technology in curriculum development* London: Harper and Row.

Sato, M. 2006. Evolving Environmental Education and its relation to Education and Population and Information for Human Environment (EPD) and Education for Sustainable Development (ESD).

Sauve, L. 1992. Environmental Education and Sustainable Development: A Further Appraisal. Canadian Journal of Environmental Education. 1. 7-33.

Senera, M. & Shaw, J. 1996. *Facts Not Fear: A Parent's Guide to Teaching Children About the Environment*. Washington D.C. Regnery Publishing.

Slattery, D. 2000. Adult Education and Ecology. *Australian Journal of Environmental Education*. Vol. 15-16. 85-93.

Stolber, C. 2008. *Environmental Degradation Issue in Nigeria*. An NTA Weekend File Network Programme Abuja.

Summer, J. 2003. Environmental Adult Education and Community Sustainability: New Directions for Adult and Continuing Education. Fall. 99(39-45).

Teseun, F. 2010. Nigeria to Prevent Major Natural Disasters BY Science Education. Vanguard Media Limited.

The United Nations Decade of Education for Sustainable Development (UNDESD). 2005-2014). *UNESCO*.

Thompson, J.C. and Gasteiger, E.L. 1985. Environmental Attitude Survey of University Students: 1971 vs 1981. *Journal of Environmental Education. 17(1), 13-16.*

UN Foundations, 2008. Doing our Part to Reduce the Impacts of Climate Change. New York City.

UNESCO – UNEP. 1978. Inter-Governmental Conference on Environmental Education. 14-26 October, Ibilisi, USSR.

UNESCO – UNEP. 1989. Environmental Literacy for All. *Connect*. 14(2). 1-2.

UNESCO – UNEP. 1999. International Environmental Education Programme. *Environmental Education* 2. 1-21.

UNESCO, 1985. Guidelines for the Development of Non-formal Environment Education. Environmental Education Series 23. Published by Division of Science Technical and Environmental Education.

UNESCO, 1985. Activities of the UNESCO-UNEP Inter Environmental Education Programme UNESCO Paris, France.

UNESCO, 1997. Education for Sustainable Future: A Tranvisionary Vision for Concerned Action Proceedings. International Conference on Environmental Society, Education and Public Awareness for Sustainability. 8-12 Dec: 1997 Thessaloniki, Greece, UNESCO Paris, France.

UNESCO, 2002. A Report Presented at the World Summit on Sustainable Development. Johannesburg.

UNESCO. 1975. *A system approach to teaching and learning procedures: a guide for educators in Developing Countries. Paris: UNESCO.*

UNESCO. 2004. Activity-Based Joyful Learning Approach. *Journal of Indian Education*. 77-88.

UNESCO. 2005. United Nations Decade of Education for Sustainable Development (2005-2014) International Implementation Scheme, UNESCO Paris France.

UNESCO-UNEP, 1987. UNESCO-UNEP Congress on Environmental Education and Training, International Strategy for Action in the field of Environmental Education and Training for the 1990s MOSCO, USSR.

United Nations, 1992. Barth Summit. Agenda 21 Programme of Action for SD. The Final Text of Agreements. UN Conference on Environment Development.

Uzokwe, A.O. 2003. Devastating Effects of Pollution in Nigeria. *African Recovery*. A United Nation Publication.

Warren, C. 1991. Population, Environment, and Development- an Inseparable Troika. *Population Journal of UNEPA*. 18(1) 4-23.

Wheeler K. 1995. International Environmental Education: A Historical Perspective. Environmental Education and Information 2(2). University of Salford: The Environmental Institute.

Wikipedia, the free Encyclopedia, 2008. Constructivism (Learning Theory). Wikipedia Foundations.

Wikipedia, the Free Encyclopedia. 2010 Chile Earthquake, Indian Ocean Earthquake and Tsunami.

Wikipedia, the Free Encyclopedia. 2010. Environmental Adult Education. *Wikipedia Foundations.*

Wisconsin Department of Public Interaction, 1994. *A Guide to Curriculum Planning in Environmental Education*. Wisconsin: Madison.

World Wide Funds for Nature (WWF). 2008 *WWF Climate News.*

WWF.1999. War on Nigerian Wetlands. *Connet.* Feature Stories.

Yager, R. 1991. The Constructivist Learning Model. *Science Teacher*. 58(52-57).

Young, A. J. & McElhone, .J. 1986. Guidelines for the Development of Non-Formal Environmental Education. UNESCO-UNEF International Environmental Education Programmes Series 23.

APPENDIX I

PARTICIPATORY NON-FORMAL EE PROGRAMME

S/N	TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	INSTRUCT-IONAL MATERIALS	METHODS/ EXPLANATORY NOTES	ACTIVITIES TO BE UNDERTAKEN BY LEARNERS	PERIOD/WEEK	EVALUATION	ASSIGNMENT
1	ECOLOGICAL FOUNDATION								
(a)	**Activity1:** meaning of environment	Learners should be able to : 1:list 10 different resources/object in the environment 2: collect the samples of objects and the resources they can see and touch 3: cite examples of those they can neither see nor touch 4: explain the meaning of environment 5: demonstrate that they as human beings are the central figure in the environment	1) Objects/ resources that can be seen and touched in the environment. 2) Objects/ resources that can neither be touched nor seen in the environment.	Real objects e.g water, plants, insects, flowers, fruits, environmental prints, household utensils, office features and fittings e.t.c.	Small group Discussion: 1: take learners out on a walk round the premises 2: ask them to pick samples of objects they can see or touch in the surrounding 3:ask them to note those objects/resource they can neither see nor touch 4: back to the classroom each group should assemble all that as been collected by members then list the name of the collected objects on a sheet of paper and be ready to present to the whole class when their turn comes	1: learners to pick real objects in the immediate environment. 2: each group assembles all the objects collected by members and then list them on a sheet of paper. 3: add other objects/resources they can neither see nor touch in the environment. 4: attempt a definition of environment. 5: and then present their group's decision to the whole class for more inputs/discussions	1	- Mention different environmental resources/objects - Explain what environment means - Name the most central figure in the environment - Prove that you as a human being is part of the environment.	Facilitator asks learners to: 1)list 10 other objects not sighted in the premises 2)identify five factors that affect human beings in the environment
(b)	**Activity 2:** Factors that affect human beings in the environment	Learners should be able to: 1: identify the environmental factors that affect them as a human beings. 2: differentiate between the positive and negative effects of the environmental factors on human beings	Transportation, politics, education, health, system, leadership, culture, scarcity, religion, inflation, production, e.t.c	Cultural artifacts, samples of raw materials and objects to be seen within the premises and the lecture hall or office	List 6 groups - each group is assigned 3 factors to deliberate on - write their decisions on paper and then present to the members of the class for more inputs/discussions.	-1- learners should deliberate on the 3 factors assigned to each of the six group -2- learners should identify the positive and the negative impacts of each of the three factors assigned to their group	1	Facilitator asks members of a particular group to identify the positive and negative effects of the environmental factors deliberated on by the class.	Facilitator asks the learners to categorize objects/resources in the environment, into various groups of their choice.

						- define environment Once again - present to the members of the class for more inputs/discussions.			
(c)	**Activity 3:** components of the environment	Learners should be able to: - group the organisms, objects, features and resources they listed during the previous lessons according to the aspects of the environment they constitute - differentiate between living and nor-living components of the environment - identify the components of the environment they cannot touch nor see or both - narrate their pelasant experiences in relation to the components of the environment. - Cite specific values they attaché to the components of the environment. Mention values of the components of the environment to human beings	1.four major components of the environment a. land b. water c. air d. plants, animal and micro-organisms 2: characteristics of each of the components of the environment	Real objects collected from their homes LGA premises and offices.	-facilitator puts learners into 6 groups - instructs them to categorize all the objects assembled by members into components	Assemble all the objects of learners to discuss and agree on how they think the objects in the environment are preferably categorized -list the common features/characteristics of objects in each of their categorization - Note the living and non living components	1	-explain what components of the environment means - what are the major-components of the environment	- identify the usefulness of the components of the environment to human beings - collect samples of objects by which human beings benefit from the components of the environment
(d)	**Activity 4:** Importance of the components of the environment	Learners should be able to: - Identify two importance of each of the components of the environment. - treat the components of the environment	1. Usefulness of: a. Land b. water c. air d. animals e. plants f. micro-organisms	-water -samples of products obtained from land and water - samples of objects by which human beings	- The facilitator puts learners into 6 groups through a lucky dip to stand in defence for a. water b. land c. air d. plants e. animals	- each learner in turn picks a 'lot' from the lucky-dip which assigns him or her to any of the six groups. - learners in their groups discuss the	1	The facilitator points at learners at random to respond to the following statements: - mention the two importance of any component of the environment you	1. How do the aspects of the environment relate to each other 2. Draw a sketch to represent the

		with respect to the important role each component of the environment play in their existence as human beings. - Demonstrate that the components of the environment are important to them as human beings. - Enumerate some values they have for the different components of the environment		benefit from air - samples of materials obtained from plants and animals,and micro-organisms	f. micro-organisms - each group to stand in for any of the aspects of the environment assigned to them by the facilitators i.e. a water	benefits of the aspect of the environment they stand in defence for. - rehearse a demonstration they would present to the whole class		know - demonstrate to the class how you as a human being benefits from a particular component of the environment. - categorise the components of the environment in their order of importance to you	relationship between the components of environment
(e)	**Activity 5:** Relationship between the components of the environment (ecosystem)	Learners should be able to: - Make a sketch and correctly label five samples of the component parts of the environment - With an arrow trace the interdependence of the components of the environment they have sketched. - Identified the role of each component of the environment in the ecosystem. - Demonstrate the position of human beings in the ecosystem.	1. Ecosystem 2. Interdependence of the organisms in the ecosystem 3. human beings and ecosystem	- Real objects in the environment - cardboard sheets, marker, pencils etc. - sketch of the ecosystem	Facilitator puts learners to new groups: - instruct that every learner should attempt to make a sketch of the relationship between the components of the environment - Curve a title to their sketch.	- in their groups each learner should draw a sketch of the ecosystem using samples of the real objects already assembled in their previous lessons - judge among themselves which of the sketches is best to represent their group's work	1	- The facilitator calls out members of the different groups in turns, to come to the chalkboard, point at a particular component of the ecosystem, mention its name and tell the class its role in the ecosystem - suggest specific ways to protect a particular component of the ecosystem	1. List various. activities involved in the following: - trading - mining - education - agriculture - construction - consumption - hunting - religion - politics 2. Read Gen. 1:28 Learner should 3. Endeavour to come with a Holy Bible for the next lesson.
2	**HUMAN ENVIRONMENT/ DEVELOPMENT**								
(a)	**Activity 6:** Human activities (Development)	Learners should be able to: - identify six activities undertaken by human beings in relation to the environment - state that every activities of human beings have effect on	Daily activities of different groups of individuals - interpretation of Gen. 1:28 - environmental friendly actions - environmental unfriendly actions	- cardboard sheets - markers etc.	Facilitator puts learners in 10 groups representing 10 groups of individuals undertaking various activities in the environment - instruct learners to demonstrate ways the groups they represent carry out their activities	In their groups learners recall various ways the group of individuals they represent undertake their activities in the environment. - they read the	1	The facilitator asks learners at random to respond to the following statements: - mention activities undertaken by any group of persons other than these of their groups. - interpret the	List various ways human activities have negatively affected the environment

		the environment - demonstrate their feelings about the environment - express the activities of various professions in relation to the environment - interpret Gen. 1:28 with particular reference to "replenish and subdue" the earth - group human activities into 2: a. replenishing b. subduing - judge whether the various developmental activities are environmental friendly or unfriendly				book of Gen. 1:28 - interpret the meaning of subdue and replenish - categorise the activities of the group they represent as either environmental friendly or unfriendly. - write their decisions on the cardboard sheets and present to the whole class for inputs/discussions.		concepts " subdue" and "replenish" - differentiate between environmental friendly and unfriendly activities - how do you feel human beings should handle the resources in the environment	
3	**ENVIRONMENTAL CHANGE/IMPACTS OF DEVELOPMENT**								
(a)	**Activity 7:** Negative effects of human activities on the environment	Learners should be able to: - mention 10 activities undertaken by human beings that affect the environment - identify, at least two human activities on each of the component part of the environment. - differentiate between human activities with negative effects and those that positively impact on the environment. - suggest ways to undertake environmentally	1. Activities that have negative effects on a. land b. water c. air d. plants e. animals f. microorganisms 2. resultant effects of such negative actions		- facilitator instructs learners to demonstrate how the components/aspects of the environment are negatively impacted by human activities	1. members of each of group examine the different effects of human activities. 2. note their negative effects 3. members of each of the groups line up before the whole class to demonstrate the negative effects of various human activities on the aspects of the environment their group represents		- Identify six environmental friendly activities. - Learners should then brainstorm on the ways human beings can undertake environmentally friendly activities. While a recorder is appointed to write all the suggested points on the chalkboard.	List at least two environmental friendly activities that could be undertaken by each of the 10 groups of individuals - Note ways to ensure a sustainable use of environment-al resources.

		friendly activities							

APPENDIX 2

INSTRUCTIONAL GUIDE FOR THE PARTICIPATORY NON-FORMAL EE PROGRAMME

INTRODUCTION

The progrqamme focuses on impacting the environmental knowledge, attitude and practices of Non-formal Adult Learners. The emphasis is on the learners' active participation in the lessons as an innovative approach to augmenting the existing traditional teacher-centred, one-directional teaching, also referred to as Non-participatory Non-formal EE. The participatory Non-formal EE is learner-centred and activity-based in approach in which the learner is actively involved during the teaching/learning sessions with minimal teacher interference.

It is on this premise that the present participatory Non-formal EE Instructional Guide was developed. The development of the instructional guide was posited on the social constructivist's instructional theory where the leaner, as an active participant in lessons, is required to construct learning using his prior knowledge. This de-emphasizes the behaviourist method of direct teaching as in the conventional lecture method where the learner does not enjoy the freedom of learning in a democratized environment.

OBJECTIVES OF THE PROGRAMME

The objectives of the programme include that the adult learners should be able to:

- develop a wholistic idea about their immediate environment
- identify the various environmental resources

- identify the value of the inter-relationships among the components of the environment.
- attach values to the various environmental resources
- differentiate between friendly and unfriendly environmental practices and habits.
- assess the negative impact of unfriendly human activities on their immediate environment
- develop affection and positive attitude towards the environment.
- engage in environmental friendly activities and act in a sustainable manner.

ACTIVITY ONE

TOPIC: MEANING OF ENVIRONMENT

OBJECTIVES

Learners should be able to:

- List 10 different resources, objects and organisms in their immediate surrounding
- Collect the samples of objects and resources they can see and touch
- Sight examples of those they can neither see nor touch
- Explain the concept of environment
- Describe the importance of the position human beings occupy in the environment.

INTRODUCTION

The environment is the basis for all life. Its major components - the hydrosphere (water), atmosphere (air), lithosphere (land) and biosphere (animals, plants and micro organisms) constitute all that make human life meaningful and worthwhile in the society. Experience has proved that no one can survive in isolation from his or her environment. However, a very common practice is that most teachers would simply present one or two or more definitions of such important concepts as environment for learners to commit to their memories through rote memorization, without allowing them the opportunity to be involved in constructing their own meanings of the concept from their own experiences.

The following activities provide an alternative way to teaching and learning of the concept of environment and other related topics in the Non-formal Environmental Education, as outlined in this present programme in particular.

STEP 1 – ORGANIZING LEARNERS INTO GROUPS BY THE FACILITATOR – 20 mins

The facilitator organizes learners into five groups by asking them to take numbers 1-5 in turn.

STEP 2 – GROUP ACTIVITIES – Defining the concept of environment – 20 mins

In their groups learners should:

(a) Work round the premises

(b) Pick various objects, features, resources/material

(c) Note those they can neither see nor touch

(d) Note other resources not seen in the immediate surrounding

(e) Back in the classroom each group to assemble and list all that has been collected by members on a paper to form their group work

(f) Them attempt a definition of environment

(g) Identify the most central figure in the environment

STEP 3 – GROUP PRESENTATION TO THE WHOLE CLASS – 15 mins

Each group should choose a representative who will present their group's work to the whole class. Since marks are expected to be awarded, oral presentation of group's works/decisions should not always be encouraged, as this may give the other group representatives the opportunity to copy and update their works while their colleagues are presenting. Group representatives may rather display their works on the chalkboard

with the aid of a masking tape or write them out on the columns of the chalkboard specified by the facilitator for each group following the rules of the exercise. The group that scores the highest points should be recognized and declared the winner. Groups should be recognized as first, second or third depending on their performances and appreciated accordingly. This exercise is guided by the following rules:

- All group representatives to face the chalkboard and start to write at the same time as will be announced by the facilitator.
- No turning back while writing on the chalkboard to avoid receiving any further assistance from their group members.
- No turning sideways – to avoid copying from each other's lists
- No more interactions with their group members
- When they are done with the exercise, the whole class appreciates them by singing for them while they dance to their seats.

STEP 4 – WHOLE CLASS DISCUSSIONS/INPUT – 25 mins

The whole class makes inputs on the items listed on the chalkboard on a group by group basis, crossing out the unnecessary and then adding other ones they think may have been omitted from the lists before them. This will ensure a more comprehensive listing of the environmental resources objects or materials, to enable them construct a definition of environment themselves based on their participation in generating the list. The whole class will also access the attempted definitions of environment by the individual groups and them agree on the one that best describes and defines what the concept of environment may mean.

STEP 5 – SUMMARY – 10 mins

The facilitator displays a definition of environment which may be a product of the inputs made by the learners.

STEP 6 – EVALUATION – 15 mins – The facilitator points randomly at learners from the different groups to:

- Mention different environmental resources/objects
- Explain what environment means
- Name the most central figure in the environment.
- Prove that they as human beings are part of the environment.

ACTIVITY TWO

TOPIC: NATURAL ENVIRONMENT

OBJECTIVES:

Learners should be able to:

- Identify the objects, features or organisms that form parts of the Natural environment.
- Group them under natural living and natural non-living environment
- Name the major aspects of the natural environment
- Group the related objects under an umbrella term
- Mention things they love about the natural environment
- Narrate folktales on the values of the environment to human beings

STEP 1 – ORGANIZING LEARNERS INTO GROUPS:- 10 mins

The facilitator requests that learners should still sit according to the groups. They belonged to in the previous lesson.

STEP 2 – GROUP ACTIVITIES – 35 minutes

In their groups, learners should:-

- List all the resources, objectives or materials that constitute the national environment
- Group the different things identified in their natural environment under broad terms namely water, air, land, plants, animals and micro-organisms.
- Give reasons for their groupings.
- Narrate a story on the value of each of the groups they made.

STEP 3 – GROUP PRESENTATIONS – 15 minutes

Representatives from the groups to display or present their group's decisions to the whole class. This must not be by the same persons who represented their groups in the previous sessions.

STEP 4 – WHOLE CLASS DISCUSSION/INPUT – 35 minutes

Members of the class to react to the individual group's presentations as displayed on the chalkboard, agree on the groupings that may best describe the major aspects of the environment.

STEP 5: SUMMARY – 10minutes

The facilitator displays a model of the major parts of the natural environment on the chalkboard for learners to update their input, where necessary.

STEP 6 – EVALUATION – 15 minutes

The facilitator throws folded piece of papers, at random to learners and requests whosoever they may falls on to stand up, unfold the paper, read the content and answer the questions.

The questions include:

- What are the major aspects of the natural environment
- Demonstrate that you as a human being is part of the environment
- Differentiate between living and non-living aspects of the environment.
- Mention the living parts and the non-living parts of the environments.

ACTIVITY THREE

TOPIC: IMPORTANCE OF THE DIFFERENT ASPECTS OF THE NATURAL ENVIRONMENT

OBJECTIVES

Learners should be able to:

- Mention two importance of each aspect of the natural environment
- Identify the role each aspect of natural environment plays in their lives as human beings.
- Write down some level of values they attach to each aspect of the natural environment.

STEP 1: ORGANIZING LEARNERS INTO GROUPS – 10 mins

The facilitator organizes the learners into six groups through a locky dip game. Each group would represent a part or an aspect of the natural environment as would be indicated on the lot picked by a participant. These are namely:

Group 1: Water

Group 2: Land

Group 3: Air

Group 4: Plants

Group 5: Animals

Group 6: Micro-organisms

STEP 2: GROUP ACTIVITIES – 20mins

Each group should discuss and write down the benefits human beings derive from 'them' as the aspects of the natural environment they represent as a group. Group

leaders should ensure that each member states at least one point during their group discussions. Groups should in addition rehearse a song or any other preferred demonstrations they could use in presenting their work to the entire class.

STEP 3 – GROUP PRESENTATION – 25 mins

The individual groups should in turn present "their" importance to the class. A recorder should be appointed from the groups other than the one currently presenting, to lists the ideas being generated on the column assigned to each group on the chalkboard.

The preferred approach would be for the entire members of each group to parade themselves to demonstrate their importance to the whole class. Each person should be prepared to highlight at least one point, with some element of pride, using the first person pronoun "I" as if the aspect of the natural environment his or her group represents is personally talking to the class.

STEP 4 – WHOLE CLASS DISCUSSION/INPUT – 20 mins

Members of the class then make their input on the group presentations recorded on the chalkboard in order to arrive at a comprehensive list of the importance of each of the aspects of the natural environment. Marks which serve as the outcome of an on-the-spot evaluation are awarded to the groups according to the number of correct points they are left with after the whole class assessment.

STEP 5 – SUMMARY – 15 mins

The facilitator then displays a model list of the importance of each of the aspect of the natural environment for the class to note. This will augment the already generated ideas where necessary.

STEP 6 – EVALUATION – 15 mins

The facilitator points at learners at random to respond to the following statements:

- Mention two importance of any aspect of the natural environment you learnt.
- Demonstrate to the class how you as a human being benefit from a particular aspect of the natural environment.
- Categorize the aspects of the natural environment in their order of importance to you as a human being.

ACTIVITY FOUR

TOPIC: INTERDEPENDENCE OF THE DIFFERENT ASPECTS OF THE NATURAL ENVIRONMENT (ECOSYSTEM)

OBJECTIVES:

Learners should be able to:

- Make a sketch of the position occupied by each of the major aspects of the natural environment.
- With an arrow demonstrate the interdependence of the different aspects of the natural environment they have sketched.
- Identify how each aspect of the natural environment relates to human beings.
- Mention the important activities they as human beings undertake in relation to each of the aspects of the environment.
- Express their feelings on their relationship with the natural environment

STEP 1 – ORGANISING LEARNERS INTO GROUPS – 10 mins

The facilitator organises learners into six groups by asking them to pick numbers 1 – 6 in turns.

STEP 2 – GROUP ACTIVITIES – 35 mins

In their groups learners to assemble all the samples of the aspects of the natural environment they listed in activities 1and 2. Each person in the groups should make a sketch of the different samples of the aspects of the natural environment on a cardboard sheet. They should demonstrate with the use of arrows the relationships that exist between the different aspects of the natural environment and the human beings. Members of each group should judge and select the best of the charts made by the

individuals. They should attempt a title to the sketch they made and then suggest what likely happens when one aspect of the items on their sketch is destroyed.

STEP 3 – GROUP PRESENTATION TO THE WHOLE CLASS – 30 Mins

Participants who made the sketches selected as the best by their group members should stand out to represent their groups before the entire class.

STEP 4 – WHOLE CLASS INPUT/DISCUSSION – 35 Mins

Members of the class will assess the charts, rank them in succession as first, second, third, fourth, fifth and sixth positions, appreciate the groups accordingly and then select the one that best represents the sketch of an ecosystem. This will be the only one that will be displayed on the chalkboard.

STEP 5 – SUMMARY – 15 mins

The facilitator to display a mode chart showing the relationships between the various parts of the natural environment.

STEP 6 EVALUATION – 15 mins

- The facilitator calls out members of the different groups in turn to perform the following activities.
- Go to the chalkboard
- Point at a particular part of the natural environment
- Mention its name
- Tell the class its role in our environment
- Suggest specific ways to protect a particular part of the natural environment.

ACTIVITY FIVE

TOPIC: HUMAN ACTIVITIES (DEVELOPMENT)

OBJECTIVES:

Learners should be able to:

- Identify at least six activities undertaken by human beings in relation to the environment
- Demonstrate that virtually every activity of human beings have effect on the environment.
- Discuss their feeling about the various activities in relation to the environment
- Demonstrate the activities of various professions in relation to the environment.
- Judge whether the various developmental activities are environmentally friendly or unfriendly.

STEP 1 – ORGANISING LEARNERS INTO GROUP: 10 mins

The facilitator organizes the learners into 6 groups by asking each participant to pick one of the folded papers which assigns him/her to any of the following groups of persons who undertake varying activities in the environment.

Group 1: Traders – Whole-sellers, retailers, petty traders e.g market women and hawkers.

Group 2: Miners – all categories of mineral extraction

Group 3: Manufacturer – all forms and levels of raw material processing, both on small and large scale basis.

Group 4: Transporters – including air, land and water transport operators both on commercial and private basis

Group 5: Construction – including roads, buildings, bridges, etc.

Group 6: Farmers – including dairy and crop farming, fish farming, snail farming etc.

GROUP 2 – GROUP ACTIVITIES – 30 mins

In their groups, learners should:

- List the various activities undertaken by groups of individuals or professions they represent as a group.
- Interpret the concept of friendly and unfriendly environmental habits/practices
- Categorize the activities of the profession represented by their individual groups, as either friendly or unfriendly practices.
- Write down their group decisions on a cardboard paper with the use of markers.

STEP 3 – GROUP PRESENTATION TO WHOLE CLASS – 20 mins

The group representatives should come to stand before the class, holding across their chests the cardboard sheets on which their group's works are written for all the class members to see. Preferably they should stand facing the class in single file to enable every to have a clear view. A time keeper should be selected to ensure that no group representative exceeds the allotted time .

STEP 4 – WHOLE CLASS DISCUSSION/INPUT – 30 mins

The members of the class make input on the works before them on a group-by-group basis. The group representatives are thereafter appreciated with singing and clapping as they dance back to their seats.

STEP 5 – SUMMARY – 15 mins

The facilitator with the aid of the learners summarizes the activities of each of professional groups in relation to the environment as represented by the groups.

STEP 6 – EVALUATION – 15 mins

The facilitator asks learners at random to respond to the following statements:

- Mention activities undertaken by any group of persons other then those worked on by their sub-groups
- Interpret the concepts of environmental friendly or unfriendly practices.
- Differentiate between environmental friendly and unfriendly activities
- How do you feel human beings should handle the resources in the environment

ACTIVITY SIX

TOPIC: EFFECTS OF HUMAN ACTIVITIES ON THE NATURAL ENVIRONMENT

OBJECTIVES:

Learners should be able to:

- Mention 10 activities undertaken by human beings that affect the natural environment.
- Identify, at least two human activities on each of the aspects of the environment,
- Differentiate between human activities with negative effects and those that positively impact on the environment.
- Mention the environmental problems facing the world presently?
- Suggest ways to undertake environmentally friendly activities.

STEP 1 – ORGANISING LEARNERS INTO GROUPS – 10 mins

The facilitator requests that learners should still sit according to their groups in the preceding lesson namely, land, air, micro-organisms. plants, animals and water.

STEP 2 – GROUP ACTIVITIES – 20 mins

Each group to discuss and list the various ways 'they', as aspects of the natural environment they represent have been negatively dealt with by human activities. They should specify the activities and their effects.

STEP 3 – GROUP PRESENTATION – 35 Mins

Groups to rehearse a demonstration of their choice like songs, rhymes, mining, or dance/drama, just to lament the various ways the aspects of the natural environment

they represent have been negatively dealt with by human beings and their developmental activities.

STEP 4 – WHOLE CLASS DISCUSS/INPUT – 30 Mins

Members of the class to criticize each group's presentation constructively and make the necessary correction/input, to enable them to highlight the actual negative effects human activities exert on the components or aspects of the natural environment so represented.

STEP 5 – SUMMARY – 15mins

The facilitator may then present a model list of effects of human activities if necessary.

STEP 6 – EVALUATION – 10 Mins

- What are some of the environmental problems facing the world presently as results of human activities?
- Identify six environmental friendly activities
- Learners should then brainstorm on the ways human beings can undertake environmentally – friendly activities. While a recorder is appointed to write all the suggested points on the chalkboard.

ACTIVITY SEVEN

TOPIC: HUMAN-MADE ENVIRONMENTAL FACTORS THAT AFFECT THE ENVIRONMENT

OBJECTIVES

Learner should:

- Identify five human made factors that affect the environment.
- Mention the good and bad effects of the factors on the environment
- Discuss how the bad effects can be taken care of.

STEP 1 – ORGANIZING LEARNERS INTO GROUPS – 20 mins

The facilitator assigns learners to group by asking them to take numbers 1 to 5 in turns.

STEP 2 – GROUP ACTIVITIES – 30 mins

In their groups, learners should deliberate on the impact the particular factor assigned to them may have on the environment. The tasks for individual groups are as indicated in the attached Activities Guide. The six factors are:

Group 1-Family size/Human population (large & small)

Group 2-Gender – (male and female)

Group 3-Age (children and adults)

Group 4-Culture (traditional and modern

Group 5-Education (literate and illiterate)

Group 6 - Occupation (skilled and unskilled, professional and non-profession means of livelihood of people)

STEP 3 – GROUP PRESENTATION TO CLASS – 10 mins

The group representatives should come to the front of the class holding the cardboard sheets on which their group's decisions are written across their chests for all the members of the class to see.

STEP 4 – WHOLE CLASS DISCUSSION/INPUT – 25 mins

Members of the class make input on the works before them on a group by group basis, after which the group representatives are appreciated by singing and clapping for them while they dance back to their seats.

STEP 5 – SUMMARY – 15 mins

The facilitator and the members of the class draw a conclusion on the extent of the effect of each of the factors.

STEP 6 – EVALUATION – 15 mins

The facilitator points at random to members of a particular group to identify the positive and negative impacts of the environmental factors deliberated upon by another group.

ACTIVITY EIGHT

TOPIC: ENVIRONMENTAL FRIENDLY HABBITS (SUSTAINABLE DEVELOPMENT)

STEP 1 – ORGANISING LEARNERS INTO GROUPS: 10 mins

Learners are organized into 6 groups using a lucky dip such that each group will represent a professional group.

STEP 2 – GROUP ACTIVITIES - 30 Mins

In groups learners to generate a list on ways the professional group they represent can undertake their activities in a more environmental friendly manner. They should then:

-Suggest another concept that addresses environmental friendly habits.

-Attempt a definition sustainable development

-Produce a chart on the most acceptable environmental friendly ways the members of the profession they represent can undertake their activities.

STEP 3 – GROUP PRESENTATION TO THE WHOLE CLASS - 25 Mins

Each group to send a representative to present its works to members of the class. This should preferably be on a group-by-group basis such that while one group representative is presenting the other group representatives should still stand out facing the class with their charts across their chests. Groups should not be allowed to make any further inputs on their works once the representatives have been called out to present. The penalty for such offence will be a deduction of 5 points from their scores for the day.

STEP 4 – WHOLE CLASS INPUT/DISCUSSION – 30 Mins

Members of the class to make input on the list generated by each group to enable them arrive at the three most acceptable environmental friendly ways they may undertake their activities.

STEP 5 – SUMMARY - 15 Mins

Each group to list boldly on a card board sheet the three most acceptable environmentally friendly ways they can undertake their activities. Still in groups, a member to lift high the write-up for all the members of the class to see.

STEP 6 – EVALUATION 10 Mins

-Each learner to mention one environmental friendly habit

-Define environment

-Mention the most central figure in the environments

-Mention the good things the various parts of the environment do to us.

-List the ways we hurt the different parts of the environment.

-What are some of the environmental problems facing the world presently?

APPENDIX 3

ASSESMENT SHEET FOR EVALUATING THE RESEARCH ASSISTANT'S PERFORMANCE ON THE USE OF THE PARTICIPATORY NON-FORMAL ENVIRONMENTAL EDUCATION INSTRUCTIONAL PROGRAMME

SECTION A

NAME OF FACILITATOR:_____

LITERACY CE CENTRE_____

PERIOD:_____

CLASS TAUGHT:_____

DATE:_____

SECTION B: RESEARCH ASSISTANT'S ASSESSMENT SHEET

S/N		Very Good	Good	Average	Poor	Very poor
1	**Flexibility** a. Patience with learners					
	b. Encouraging an atmosphere of trial and error					
2	**Enhancing learners participation skills**					
	a. Encouragement of equal participation of all members					
	b. Ensuring peaceful cooperation among group members					
	c. Assigning roles to learners					
	d. Allowing learners to assume responsibility for their learning					
	e. Encouraging learner creativity					
	f. Appreciation of individual/group participation					
3	**Organizational skills**					
	a. Seating arrangement					
	b. Class control					
	c. Organizing learners in group					
4	**Social skills**					
	a. Courteous in talking to learners					
	b. Interaction with learners					
	c. Catering for personal interest of learners					
	d. Giving attention to learners					

5	**Monitoring Skills**					
	a. Walking round to check learners' abilities while the groups are at work					
	b. Monitoring group presentations					
	c. On-the-spot assessment					
	d. Adherence to the allotted time to the steps.					
6	**Intellectual Skills**					
	a. Content mastering					
	b. Clarity of instruction					
	c. Summarizing the lessons					
	d. Evaluating learning outcomes					
7	**Concept coverage**					
	a. Meaning of environment					
	b. Natural environment					
	c. importance of the parts of natural environment					
	d. Importance of the components of the environment					
	e. Interrelationship between the components of the environment (Ecosystem).					
	f. Human activities (Development).					
	g. Effects of human activities on the environment.					
	h. Way forward (Sustainable Development).					

APPENDIX 4

ENVIRONMENTAL KNOWLEDGE TEST (EKT)

SECTION A: PERSONAL DATA

1. Name of participant:----------
2. Gender: Male ☐ Female ☐
3. Class: JSS 1 ☐ JSS 2 ☐ JSS 3 ☐ SS1 ☐ SS2 ☐
4. Literacy Centre:----------
5. Age: Specify age if below 20yrs ☐ 20-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 41 and above ☐
6. Occupation----------
7. Have attended seminars, workshops or conferences on issues affecting the environment? Yes ☐ No ☐
   If yes indicate where----------
   When----------

SECTION B

Instruction

Below are some questions on environmental issues. Please choose from the answers, numbered A-D your best option for each of the questions. Circle only **one** answer that best represents your choice.

1. The environment is made up of _____
   (a) Human beings alone
   (b) Plant and animals alone
   (c) Only the atmosphere around us
   (d) Everything we can see and torch and the ones we cannot see and touch

2. The objects in the environment may be grouped into _____
   (a) Natural and human made
   (b) Plants and animal organisms
   (c) Male and females organisms
   (d) Dry and wet objects

3. Which of the following is the most central figure in the environment?
   (a) Air
   (b) Plants and animals
   (c) Human beings
   (d) Water

4. We depend largely on _____ to be alive.
   (a) Other human beings
   (b) Our environment
   (c) Our occupation
   (d) The kind of food we eat

5. The survival of human beings largely depends on their relationship with _____
   (a) Other human beings
   (b) The environment
   (c) With what they do for a living
   (d) Kind of food they eat

6. The group of people closest to the environment are the _____
   (a) Women
   (b) Men
   (c) Children
   (d) Youth

7. _____ are responsible for destroying the environment in Nigeria
   (a) The poor
   (b) The rural dwellers
   (c) The educate and uneducated
   (d) The manufacturing industries

8. _____ can be described as environmental managers
   (a) Children
   (b) Youth
   (c) Women
   (d) Men

9. Learning more about the environment will involve _____
   (a) Teaching the educated masses
   (b) Teaching students in school
   (c) Teaching the children and adults
   (d) Teaching the youth in and outside the school

10. The natural environment may be broadly grouped into _____
   (a) Seven
   (b) Three
   (c) Five
   (d) Six

11. Plants and animals are examples of the _____
   (a) Water
   (b) Land
   (c) Natural living environment
   (d) Atmosphere

12. _____ is\are found basically in the atmosphere
   (a) Birds
   (b) Ozone layer
   (c) Natural gases
   (d) Organic matters

13. Water is primarily the home place of _____
    (a) Animals
    (b) Salt
    (c) Sand
    (d) Carbon dioxide

14. The non-living things in the environment are useful because they _____
    (a) No longer have power to destroy other things
    (b) Support lives
    (c) Keep the environment cool and quite
    (d) Provider shelter

15. Different things we obtain from the environment are said to be unique in nature because they _____
    (a) Serve the same purposes
    (b) Serve universal purposes
    (c) Serve many purposes
    (d) Serve peculiar

16. One of these is a major way we benefit from land
    (a) Housing
    (b) Fishing
    (c) Oxygen
    (d) Irrigation

17. _____is responsible for the decay of dead animals and plants.
    (a) Micro-organisms
    (b) Rainfall
    (c) Sunlight
    (d) Heat

18. In interdependence of the various aspects of the natural environment, when one is destroyed it implies that _____
    (a) The others can continue with the process with little delay
    (b) The process cannot continue
    (c) No harm is done on the process
    (d) The others can supply what has been destroyed

19. Human beings play the role of _____
    (a) Primary producers
    (b) Secondary consumers
    (c) Primary producers
    (d) Secondary producers

20. Human beings affect the environment in bad ways through _____
    (a) Too many sanitation exercises
    (b) Punishing those who fails to pay environmental levies
    (c) Charging fines for breaking environmental laws
    (d) Bush burning

21. Fishing, grazing and livestock rearing are associated with _____
    (a) Agriculture
    (b) Trading
    (c) Animal husbandry
    (d) Domestic activities

22. One of the best ways to make children learn good environmental habits is by _____
    (a) Sending them empty garbage in the public waste bins
    (b) Sending them to school at a very tender age
    (c) Allowing them not to interact with the things in the environment
    (d) Allowing them to interact with things in the environment

23. Part of the practices that have negative effects on land include _____

(a) Large family size

(b) Planting tress on every available land

(c) Not farming on a piece of land for too long

(d) Burying garbage

24. People may suffer hunger/starvation as a result of _____

(a) Use of fertilizers

(b) Not farming on the same portion of land every year

(c) Aforestation

(d) Paying environmental sanitation bills

25. _____ is a major cause of environmental degradation in Nigeria

(a) Inter-tribal conflict

(b) Poverty

(c) Industrial waste

(d) Sickness

26. One of the ways we can reduce global warming in through _____

(a) Aforestation

(b) Deforestation

(c) Gas flaring

(d) Rapid development

27. The best approach to development is to _____

(a) Import the biggest technological gargets

(b) Clear every available bush

(c) Replace every used resources

(d) Allow the future generation to develop suitable technology

28. One of the following statements best describes wastes

(a) Unwanted materials we must not use

(b) Materials we are wise enough to throw away

(c) Materials we are not wise enough to use

(d) Materials we do not need anymore.

29. Restricting the practice of forest clearing may result to _____

(a) Under-development

(b) Poor environmental management

(c) Environmental balance

(d) Environmental inbalance

APENDIX 5

ENVIRONMENTAL PRACTICE-RELATED QUESTIONNAIRE

SECTION A: PERSONAL DATA

1. Name of participant:----------
2. Gender: Male Female ☐
3. Class: JSS 1 ☐ JSS 2 ☐ JSS 3 ☐ SS1 1 ☐ SS2 ☐
4. Literacy Centre:----------
5. Age: Specify age if below 20yrs ☐ 20-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 41 and above ☐
6. Occupation----------
7. Have attended seminars, workshops or conferences on issues affecting the environment? Yes No
   If yes indicate where----------
   When----------

SECTION B: QUESTIONS

Instruction:

Below are some statements on environmental issues and concepts. Please tick (ö) in the box that matches the extent to which you engage in the activities stated below.

S/N	STATEMENTS	Very often	Often	Seldom	Never
1	Walk round to observe different objects/resources in your surrounding?				
2	Plant trees to grow around your house/office?				
3	Grow bushes around your home?				
4	Consider the micro-organisms as things that do not yield any benefit to the environment? Cut surface of the soil				
5	Enjoy using much water to take your				

	bath?				
6	Enjoy eating bush meet?				
7	Farm on one piece of land every farming season				
8	Go out to observe the interrelationship among the different aspect of the environment.				
9	Cut down trees around your surrounding?				
10	Participate in the monthly environmental sanitation exercise?				
11	Pay environmental sanitation levies promptly?				
12	Participate in wild-life protection exercise.				
13	Read from the scriptures to prove to people that human beings should care for the environment?				
14	Empty your gabade in any available empty space?				
15	Regard the clearing of all surrounding forests for developmental purposes as a good practice?				
16	Send the children to empty your garbage?				
17	Cut down trees without replanting?				
18	Farm without applying the artificial fertilizers?				
19	Make efforts to stop climatic change?				
20	Encourage having many children by individuals?				
21	Take part in flood preventive measures?				

22	Throw your garbage in the open garbage dune?				
23	Burn your garbage?				
24	Cook with firewood in your home?				
25	Leave the tap running while brushing your teeth?				
26	Bath your children or siblings with a lot of water.				

APPENDIX 6
ENVIRONMENTAL ATTITUDE QUESTIONNAIR (EAQ)

SECTION A: PERSONAL DATA

1. Name of participant:----------
2. Gender: Male ☐ Female ☐
3. Class: JSS 1 ☐ JSS 2 ☐ JSS 3 ☐ SS1 ☐ SS2 ☐
4. Literacy Centre:----------
5. Age: Specify age if below 20yrs ☐ 20-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 41 and above ☐
6. Occupation----------
7. Have attended seminars, workshops or conferences on issues affecting the environment? Yes No

   If yes indicate where----------

   When----------

SECTION B

Instruction: Below are statements on environmental issues and concepts. Please tick ( ) in the box that matches the extent of your agreement or disagreement with each statement.

S/N	Statements	Strongly Agree	Agree	Disagree	Strongly Disagree
1	I feel it is not possible for everything to be part of the environment				
2	People can survive in isolation from their environment				
3	I believe that the environment is not the basis for all life				
4	I am a major actor in the environment				
5	Human population exert much pressure on the environment				
6	Educated people do not contribute to environmental problems				
7	Women are the ones mostly affected by environmental problems				
8	I think the environment can be grouped into components				
S/N	Statement	Strongly Agree	Agree	Disagree	Strongly Disagree
10	I should bother about things I cannot see or touch of				

	my environment				
11	I think only the objects I can see and touch can affect my life				
12	I believe that water, air, plants and animals provide identical resources				
13	Wild animals do not deserve to be protected since they can harm human beings				
14	Forest are of importance to the urban centres				
15	I think that the presence of water bodies can affect the climate.				
16	Land do not support other living things in the environments				
17	I see the environment as a related body of resources				
18	I think it is possible for land to benefit from trees				
19	I feel that when only one aspect of the environment is destroyed the rest can continue				
20	Bush burning is a bad agricultural practice				
21	Dropping refuse into a flowing river is another good way of refuse disposal.				
22	I think that the emission of poisonous gases into the atmosphere by industries is a good practice.				
23	Building shops/kiosks in front of the main houses help to protect the environment.				
24	Bush clearing pollutes the air we breathe				
25	I believe that human brings have nothing to do with global warming				
26	As leaders of tomorrow children should be the ones to preserve the environment for future generation				
27	Farming on one piece of land every farming season will do some harm on it in the future				
28	I believe we owe a duty to preserve the environment				
29	Achieving a sustainable environmental development is an impossible task				
30	Caring for the environment is part of God's commandments to us.				

APPENDIX 7

CONVENTIONAL LECTURE METHOD GUIDE

LECTUE ONE

TOPIC: Meaning of environment

TIME: 1Hr

OBJECTIVES: At the end of the lecture and learners should be able to:

- Define the concept of environment
- Explain the meaning of environment
- Identify the place of human beings in the environment
- Mention the things that are found in the environment

STEP 1 – Teacher introduces the concept of environment – 10mins

The term environment is a very broad concept. To a good number of scholars, environment means an aggregate of all the external conditions that influence the life of an individual organism or population. To some others it denotes the immediate surrounding.

Others still see environment as comprising of plants and animals in the bush while some may simply define it as the air around us. All these in one way or the other pertains to the concept of environment, however in a more elaborate fashion, environment may be defined as the communication of natural objects (living and non living), and objects made by human beings, the interrelationship between these and various circumstances which surround people on earth. These therefore entails that the environment comprises of the mountains, hills valleys, sands, gravels, rivers, oceans, ponds, winds, trees, vegetables, fruit, forests, bushes, animals, (both domestic and wild),

insects, birds and fishes, bacteria, worms, ants, roads, building, footpaths, farms, dams and well as the social, economic, cultural, educational, religious and legal institutions, and systems in the society. This therefore implies that everything in a particular place where an individual or organism finds himself form his environment.

STEP 2 – Teacher discusses facts or ideas on the concept in steps – 20mins

Types of environment

a. Natural environment
b. Human-made environment

a. The natural environment consists of all the living things such as plants, animals and micro organisms as well as non-living objects like land, water, air, rocks, mountain, houses etc.
b. The human-made environment includes all forms of human interaction and their consequent creations, such as religious worship, banks, markets, schools, museums, food, culture, laws, arts, customs, dressing, language etc.

Human beings constitute a central factor in the earth's environment. The environment is the basis for all life. Every human endeavour revolves round the environment and no one can ever survival away from his environment. An adage state that "no man is island" while another say that "man is the product of his environment". These may imply that human beings influence and are in turn influenced by the environment.

STEP 3 – Teacher gives notes on the concepts taught – 15mins

The teacher either dictates or displays his notes on cardboard sheets before the class for them to copy.

STEP 4 – Teacher asks learners questions on the facts or ideas taught – 10mins

- What is the meaning of environment?
- What are the objects found in the environment?
- What is the place of human beings in the environment?

STEP 5 – Teacher gives assignment to learners – 5mins

- List ten other objects you can see in your surrounding at home.
- Categorize the objects into natural and human-made.

LECTURE TWO

TOPIC: Natural Environment

TIME: 1Hr

OBJECTIVES: At the end of the lecture learners should be able to:

- mention the components of the environment that exist naturally
- identify the components of the environment they cannot touch or see or both
- recognize the values of the components of the environment to human beings.

STEP 1 – Teacher introduces the topic

The various objects that constitute the environment may be grouped into four broad components namely:

(1) Land (lithosphere)

(2) Air (atmosphere)

(3) Water (hydrosphere)

(4) Plants, animals and microorganisms (biosphere).

STEP 2 – Teachers discusses facts or ideas on the concept/topic in steps – 20mins

1. Land (lithosphere):

This is the solid portion of the earth which is underlain by different kinds of rocks while mountains, hills, valleys, caves, plateaus etc. are some of the special features situated on the land surface. Land is fixed, thus does not expand as human population increases. Some of its part is occupied by hot deserts, swamps and useful for any meaningful activities. Land covers about one-third of the earth's surface.

2. Water (hydrosphere)

Water is the wet portion of the earth, usually in form of rivers, oceans, lakes, lagoons, streams, seas, gaseous water vapour, frozen water in form of snows. Water covers more two-thirds of the earths surface. It is more abundant in supply than land. It is however, limited to in nature with only a small fraction of it suitable for drinking. It is not an endless renewable resource. As such some areas may suffer shortage of it depending on their geographical location in the global village.

3. Air (atmosphere)

   This comprises the gaseous portion of the earth, including the air we breath in or oxygen also known as life support gas as well as others like carbon dioxide, nitrogen etc. It is arranged in concentric layers;

   - The trosphere – lowest and most useful to human beings. About 5miles or 8.05km (17.7km above sea layer).
   - The stratosphere – with high concentration of ozone.
   - Ionosphere – about 400km above sea level
   - The exosphere – about 966km above sea level.

4. Biosphere – This is the portion of the environment that is capable of supporting life. This include the plants, animals and microorganisms.

STEP 3 – Teacher gives notes on the topics taught – 15mins

The teacher displays the cardboard sheet containing his note for the learners to copy.

STEP 4 – Teacher asks questions – 10mins

- What are the 4 major components of the environment?
- Mention the components of the environment you can neither see nor touch?

- What are importance of the components of the environment to human beings.

STEP 5 – Teacher give assignment – 5mins

- List 20 objects found in your place of work.
- Group the object under their different components.

LECTURE THREE

TOPIC: IMPORTANCE OF THE DIFFERENT ASPECTS OF THE NATURAL ENVIRONMENT

TIME: 1Hr

OBJECTIVES: At the end of the lecture learners should be able to:

- state two importance of each of the components of the environment
- identify the benefits they as human beings derive from each of the components to the environment.

STEP 1 – Teacher introduces the topic/concepts – 5mins

The importance of the environment cannot be overemphasized. Each of the components offers various benefits to the wellbeing of individuals and society at large. In this lecture, steps will be taken to discuss the various uses of the components of the environment.

STEP 2 – Teacher discusses facts or ideas on the concept/topic in sets – 20mins

1. The lithosphere (land)

   Usually the land is useful in the following ways:

- Agricultural purposes: This represents the most important use of land. Through the different forms of agricultural practices food and raw materials including yam, cassava, potato tubers, cocoa, palm oil, rubber, cashews, plantations, animals, fishes snails among others. are produced. Other uses of land include forestry and animals as well as woods. Settlements and other infrastructures are also built on land minerals resources are also extracted from the land.