An exploration of the potential for Nigerian secondary schools to contribute to national sustainable development through the provision of education for sustainable development (ESD).

A thesis submitted

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By

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Abstract

The aim of this research was to find out if a specific model of education for sustainability known as the 'Whole School Approach' could apply successfully to formal junior secondary education in Rivers State in Southern Nigeria. The research findings show that, whilst the Whole School Approach is a commendable model for raising awareness about sustainable development, there are challenges in applying it to junior secondary education in Rivers State. These challenges arise because the Whole School Approach assumes certain criteria from formal education, which Rivers State did not meet; such as adequate funding, adequate infrastructure and adequate teacher training.

The research used a qualitative, case-study strategy of four junior secondary schools in Rivers State. Methods of data collection were observations in the schools, interviews of teachers and educational policymakers, and focus groups with students at the schools. Data was also drawn from content analysis of Nigerian education policy documents and curricula in the following subject areas: basic science, basic technology, religion and national value and cultural and creative arts.

The empirical research is underpinned by a theoretical evaluation of the concept of sustainable development, which shows it is a flexible rather than a fixed idea. And by a critical survey of education for sustainability pedagogies, focussing on a critical analysis of the Whole School Approach in particular.

The research contributes to new knowledge in two main ways; first, by evaluating the Whole School Approach in the novel context of Nigerian secondary education; and second, by an empirical investigation into education for sustainability in Nigerian junior secondary schools. The research findings are beneficial to education policymakers in Nigeria, scholars of Nigerian education and to education for sustainability scholarship more widely.

Dedication

I dedicate this thesis to God Almighty, who gave me the opportunity and provided the funds for this study through my family. By His grace, I was alive to complete this thesis, despite all the challenges that came across my way. I will forever serve You, Lord.

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Table of Contents

List of Tables

List of Figures

Acronyms

DESD	Decade of Education for Sustainable Development
ESD	Education for Sustainable Development
FGN	Federal Government of Nigeria
IIS	International Implemental Scheme
IPCC	Intergovernmental Union for the Conservation of Nation
LGA	Local Government Area
MDGs	Millennium Development Goals
MoE	Ministry of Education
NERDC	National Education Research and Development Council
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
NPC	Nigeria Population Commission
PRB	Population Reference Bureau
UBEC	Universal Basic Education Commission
SDGs -	Sustainable Development Goals
SEEPs	Sustainability in European Primary Schools
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCED	World Commission on Environment and Development
WHO	World Health Organisation
WSA	Whole School Approach

Declaration

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree, and does not incorporate any material already submitted for a degree. It has passed the University Library's plagiarism check through 'Turnitin'.

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Chapter One – Introduction

Introduction

This chapter sets out the background of this research by discussing, in brief, the concepts of sustainable development and the events that brought about this concept. The chapter also explores goals of sustainable development, what it aims to achieve and the underlying principles that lead to the concepts' intended achievements. Consequently, the chapter evaluates the possible means of achieving sustainable development. It explores the context of the research with an overview of the demography of Nigeria and its educational system. The study explains the philosophy of education in Rivers State in particular and the National Policy on Education in Nigeria in general. Also explored in this chapter is the purpose of the research, the aims, objectives, the research questions and the summary of findings. Finally, the chapter maps out the structure of the thesis to help orientate the reader.

This thesis reports on the findings of my research, which is a case study of four junior, state secondary schools in Rivers State, Nigeria. The purpose of the research was to explore the potential for Nigerian secondary schools to contribute to national sustainable development through the provision of education for sustainable development (ESD), in Rivers State, within the context of Nigerian education policy and practice. The theoretical framework guiding the research is the Whole School Approach (WSA) to education for sustainability, and the Sustainable Development Goals (SDGs). These are discussed in detail in chapter two and three respectively. Briefly, WSA to education for sustainability demands that all aspects of a school and the local community are involved in the move to achieve a sustainable society by incorporating and practising the SDGs. The research evaluates the extent to which WSA could work in Nigerian secondary education.

1.1 Background of the Study

1.1.1. Sustainable Development

As a concept, sustainability responds to a growing concern about the adverse impact of technology and increases in the level of human degradation on the natural environment by societal activities in the past two centuries. Development became the guiding principle of countries across the world after the Second World War (Khataybeha, Subbarinia, and Shurmana, 2010). Countries embraced the modern scientific and technological developments without fully considering the wider implications on the future of the planet. According to Defra (2011), a horde of problems such as increased pollution, loss of biodiversity, abuses of human rights, inefficient use of energy, global warming and a widening gap between the rich and the poor, have been rapidly created by humans because of a preoccupation with material comforts.

These impacts on the natural environment compelled world leaders to seek solutions in order to protect the planet's natural resources, promote prosperity through equity of opportunity and reduce poverty. Several summits held from Stockholm 1972 to Rio de Janeiro 2012 demanded a decent standard of living for everyone without compromising the needs of future generations (Drexhage and Murphy, 2010).

1.1.2 Global Sustainable Development

The concept of sustainable development formed the basis of the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. The summit was the first international attempt to draw up action plans and strategies for moving towards a more sustainable pattern of development. Over 100 Heads of State and representatives attended it from 178 national governments. Representatives of varied organisations of the civil societies also attended the Summit. In the 1987 Brundtland Commission report commonly referred to as "Our Common Future", sustainable development was seen as the feasible solution to the problems of environmental degradation (Dresner, 2008).

The Brundtland Report investigated the numerous concerns of the environmental degradation of the previous decades, which were the results of the severity of the impact of human activities on the planet. Key works that highlighted this thinking included Rachel Carson's Silent Spring (1962), Garret Hardin's Tragedy of the Commons (1968), the Blueprint for Survival by the Ecologist magazine (1972) and the Club of Rome's Limits to Growth report (1972).

The concept of sustainable development received its first major international recognition in 1972 at the UN Conference on the Human Environment held in Stockholm. The term “sustainable development” was not explicitly referred to, but nevertheless the international community agreed to the notion - now fundamental to sustainable development - that both development and the environment, hitherto addressed as separate issues, could be managed in a mutually beneficial way (Dresner, 2008).

The term was popularised 15 years later in “Our Common Future”, report of the World Commission on Environment and Development, which included what is deemed the 'classic' definition of sustainable development: "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland and Khalid, 1987 p.41). However, it was not until the 1992 Rio Summit, that world leaders recognised sustainable development as the major challenge as it is today.

In 2002, 191 national governments, UN agencies, multilateral financial institutions and other major groups met in Johannesburg to assess progress since the 1992 Rio summit. The Johannesburg Summit delivered three key outcomes: a political declaration, the Johannesburg Plan of Implementation, and a range of partnership initiatives. Key commitments included those on sustainable consumption and production, water and sanitation, and energy (Dresner, 2008). More recently, another conference was held in Rio de Janeiro, Brazil in June 2012. The conference ensued in a focused political outcome document containing clear and practical measures for implementing sustainable development (Huckle and Wals, 2015). The member states in attendance launched a process to develop a set of Sustainable Development Goals (SDGs), which will build upon the Millennium Development Goals (MDGs) and coverage with the post-2015 development agenda (Dresner, 2008).

1.1.3. The Sustainable Development Global Goals

The SDGs, otherwise known as the Global Goals, are a universal call to end poverty, protect the planet and ensure that people enjoy peace and prosperity. The 17 goals are interconnected and built on the successes of the Millennium Development Goals, the new focus includes; climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. Often the key to success of one goal involves tackling issues more commonly associated with another. In view of this, this study believes that with the achievement of Goals 4 (SDG4), which emphasises inclusion, equity and quality education with observable learning outcomes, the solution to global issues can be achieved. Discussion on how quality education can help achieve this is in chapter two, section 2.2.3.

The SDGs work in the spirit of partnership and pragmatism with the right choices which centres on improving life sustainably for future generations. They provide clear guidelines and targets for all countries to adopt following their priorities and the environmental challenges of the world at large. The SDGs are an inclusive agenda, aiming to tackle the causes of poverty and unite the world together to make a positive change for both people and planet.

1.1.4. The Principles of Sustainability

Equity between and within generations underpins the five core principles of sustainability. Each of the principles has its own derived policy and operational implications and is fundamentally systematic - that is, each principle affects all the others and is affected by each in return.

The material domain that is the first principle ensures that the flow of resources, through and within the economy is as nearly non-declining as is permitted by physical laws. The second principle is the economic domain, which is concerned with adopting an appropriate accounting system, which is fully aligned with the planet's ecological processes and reflecting exact, comprehensive biospheric pricing to guide the economy. The third principle is the domain of life; this principle is to ensure that the essential diversity of all forms of life in the biosphere is maintained. The social domain is the fourth principle, equity, underpins this principle. The degree of freedom and self-

realisation are maximised without any individual or group, adversely affecting others. The fifth is the spiritual domain, which encompasses all the other four principles (Ben-Eli, 2004).

1.1.5 Brundtland Report and Agenda 21

The UN in 1983, organised the World Commission on Environment and Development (WCED). This summit addressed the growing concern about the effect of the increasingly deteriorating human environment and the natural resources. The outcome of WCED meeting produced a report tagged ‘our common future’ in 1987, popularly known as the Brundtland Report named after the Chairman of WCED, Gro Harlem Brundtland. The focus of Brundtland Report was on global sustainability. The report addressed issues concerning governments and businesses. Also discussed were issues concerning citizens, as their welfare formed an essential element for environment and development policies. Hence, the report provided a broad overview of the major global environmental crisis and offered plans on how to resolve these problems. Environmental issues formed the burning issues in the report and formed top priorities on the political agenda as the basis for discussing the environment and development as a single and identical issue. The Brundtland Report and the concept of sustainability are viewed as an attempt to create awareness on the disturbing relations between human society and the natural environment, focusing on institutional, economic, ecological and social aspects.

The work of WCED and the publication of Brundtland Report underpins the Rio Declaration created at the 1992 Earth Summit, the adaptation of Agenda 21 and the formation of the UN Commission on Sustainable Development.

Agenda 21 was adopted at the Earth Summit in 1992, twenty years after the Stockholm conference. This was the first UN document to identify the roles and responsibilities for UN and governments, offering a practical approach to applying sustainable development policies at local, national and global levels. The Agenda comprised of 40 chapters, presented under four sections, which addressed the social and economic dimensions, conservation and management of resources for development, strengthening the role of major groups and means of implementation. Each chapter

defines a programme area under four parts: the basis for action, objectives, activities and means of implementation.

The Agenda formed the basis for a global partnership to encourage cooperation among the 178 nation/governments present at the Earth Summit in 1992, as they support a transition to sustaining life on earth. Although the Agenda lacks the force of international law, the central belief is that all countries can protect their environments and experience growth concurrently (UNESCO, 2005). Therefore, the responsibility of implementing Agenda 21 lies with the governments primarily, through national strategies, plans, policies and procedures. The Agenda also recognised education as an indispensable tool for achieving sustainability, and this led to the establishment of the UN Decade of Education for Sustainable Development from 2005 to 2015 (UNESCO, 2005).

Education was emphasised as playing a pivotal role in achieving sustainable development during the 1992 summit, and driving progress on orienting education strategies towards sustainable development as germane. Consequently, many countries like England, Germany, Finland, started incorporating principles of sustainable development into their curricula and establishing national coordinating bodies for the promotion of education for sustainable development (Shallcross, Loubser, Le Roux, O'Donoghue and Lupele, 2006).

1.1.6 Education for Sustainable Development

After the 1992 Rio de Janeiro summit, the stakeholders at the summit realised that progress on the path towards attaining sustainable development was too slow; hence they devised means of achieving their goals. At the 1992 Rio summit, the stakeholders recognised the role of education in society, and as a result advocated incorporating the principles, practices and values of sustainable development into all aspects and facets of the society through education (UNESCO, 2014). In addition, at the 2002 Paris Conference organised by the United Nations Educational, Scientific and Cultural Organisation (UNESCO), a sub-body of the UN, education formed the prevalent theme. Hence, the Summit declared 2005-2014 as a Decade for Education for Sustainable Development (DESD) in the hope of using education as a tool for

overcoming poverty, promoting health, achieving gender equality, protecting the environment, developing rural and cultural diversity, political stability and sustainable urbanisation (UNESCO, 2005a). After the DESD period, stocktaking of the DESD agenda by UNESCO proved that the decade yielded an unprecedented progress in achieving education for all; hence the 2015 United Nations summit held at New York adopted an education Post-2015 agenda to complete the unfinished business by going beyond the previous goals in terms of depth and scope.

1.1.7 Building a More Sustainable World through Education

Section ‘1.1.6’ above, provides the evidence that education was given a high priority during the 1992 summit at Rio de Janeiro in achieving sustainable development. At the summit, ESD was believed to be the key to resolving most of the issues that affect sustainable development, such as climate change, disaster risk reduction, biodiversity, poverty reduction and sustainable consumption because of their integration into teaching and learning. ESD entails participatory teaching and learning approach aimed at motivating and empowering learners to change their behaviour and take action for sustainable development. Furthermore, ESD aims to give learners the opportunity to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. Consequently, knowledge acquired through ESD promotes the learners' competencies like critical thinking, a situation where they can imagine future scenarios and make informed decisions (UNESCO, 2014).

1.1.8 Models of ESD

Different frameworks have been developed to encourage countries to incorporate and improve ESD into their formal education systems in all relevant subjects owing to the interdisciplinary nature of ESD. Some of these frameworks are Reorienting Teacher Education, Strength Model and a Whole-School approach to sustainability (Mckeown, 2002).

1.1.8.1 Reorienting Teacher Education

This framework prepares teachers for active/interactive learning processes, rather than a one-way transfer of knowledge (McKeown, 2002). It is therefore seen as an essential approach to achieving a sustainable society (UNESCO, 2004). Initial, or pre-service, teacher education provides a strategic opportunity for ensuring that all teachers are ready, willing and able to teach sustainability when they begin their teaching careers (Mckeown and Hopkins, 2003). According to Mckeown and Hopkins (2003), this framework will enable reshaping education systems by reorienting teacher education towards sustainable development concept. However, this framework has not been used to its full potential according to Ferreira, Ryan, and Tilbury, (2006). However, this is because ESD remains the concern of only a few who only address the issue in piecemeal fashion. Consequently, the only teachers engaged were those already interested and committed to ESD ideals. This study is based on the assumption that there may be a better alternative

1.1.8.2 Strengths Model

The Strength Model, unlike Reorienting Teacher Education model, allows every discipline and every teacher to contribute to sustainability education (Mckeown, 2002). This is in support of Moore's (2005) recommendation that ESD should be interdisciplinary, collaborative, experiential and potentially transformative. This means that every subject would have an obvious element of ESD in it, that will possibly transform the pupils and all that is involved in transferring the knowledge.

The strengths model ensures that educators and administrators understand the concept of sustainability and are familiar with its principles through the introduction of ESD in pre-service and in-service teacher education (Mckeown, 2002). When the concept of sustainability is understood, educators from each discipline would be able to examine the curriculum and school activities for existing contributions to ESD. This would enable the educators to identify potential areas of the existing curriculum in which to insert examples that illustrate sustainability or additional knowledge, issues, perspective, skills or values related to sustainability. After identifying existing and potential contributions, they can then create awareness among the educational community of these contributions to the larger ESD picture which can be woven

together to create ESD programs that are taught overtly to pupils. This model seems better than the first model because of the strengths of combining educational disciplines that encourage the interdisciplinary and collaborative aspect of ESD. However, it does not give room for active participation by the pupils and subsequent evaluation of the process. This implies that the success or failure of the model, as well as lessons learnt, would be unknown.

1.1.8.3 Whole School Approach to Sustainability (WSA)

A whole-school-approach to sustainability brings together everyone involved in the school to identify issues, set priorities, plan solutions and put them into action (Mathar, 2013). It strengthens a variety of relationships that exist, according to Shallcross (2003), and enhances the potential for the school community to govern themselves.

Pupils learn more than the official curriculum while in school, as stated by Henderson and Tilbury (2004). They acquire some knowledge like cultural norms, values and behaviour from other pupils, teachers and non-teaching staff. They are very quick to notice discrepancies between what is taught and what occurs around them.

WSA encourages schools to practise what they teach by trying to minimise the gaps between the values they profess and the values implicit in their actions. This approach seeks to integrate all aspects of education by linking formal education; what happens in classrooms, with non-formal education; what happens in other aspects of a school, and informal education; what happens in community life that influences learning (Shallcross, 2003). This implies that what is taught about environmental problems in the formal curriculum is, where possible, reflected in day-to-day practice in school's non-formal curriculum. According to Posch (1999), WSA integrates pedagogy with the social/organisational and technical/ economic aspects of school practice. In support of this, Orr (1994) said effective ESD should transform not only the content and processes of the formal curriculum and the purposes of learning but also how educational institutions (school ethos) and educational buildings work.

The WSA approach places emphasis on the need to make interdisciplinary and systemic connections between disciplines, which involves critical thinking, giving room for students to identify and analyse the broader societal, economic and environmental

connections for the subjects' area and show respect and understanding for all subject areas.

1.1.9 The Research Context: Nigeria

Nigeria is a country in the west of Africa, on the Gulf of Guinea with an estimated area of 923,768Km2. The country is bordered to the west by the Benin Republic, to the east by Cameroon and the Chad Republic, and to the north by Niger. Its waterways stretch up to 8,600 km, and are, made up of two major rivers, the Niger and the Benue rivers, and other smaller rivers and creeks (Adetoro, 2014). Nigeria is made up of 36 states and a federal capital territory, Abuja. It is the most populous country in sub-Saharan Africa, according to Population Reference Bureau's (PRB) record, and the 7th in the world with an estimated inhabitant of about 187 million (PRB, 2016). United Nations (UN) recorded 186.9 million (UN, 2016), while the World Bank has Nigeria's population to be 182.5 million (World Bank, 2016). Meanwhile, according to Nigerian Population Commission (NPC) record, the country's population is 140.4 million (NPC, 2016). These differences in population estimates between Nigeria's record and the other records from different organisations could be attributed to the fact that Nigeria conducts a census every ten years and the last was conducted in 2006. Also, there is a slight difference in the record of PRB and World Bank which was carried out the same year. This could be suspected to be attributed to ineffective data records. According to Adetoro (2014), Nigeria has a poor planning and record keeping system. However, the United Nations has projected a population of 337 million by the year 2050 due to its growth rate of 2.63% (UN, 2016). In Nigeria, the official language used in communication in the English language.

Nigeria is a tropical country with a favourable climate, dense vegetation which encourages biodiversity and numerous natural resources such as crude oil. It has the potential to have a thriving agricultural sector, though the government's revenue depends majorly on the oil sector thereby leaving the agricultural, non-oil sectors and the educational sector underdeveloped (Okonjo-Iweala, 2014). As a developing country, Nigeria is being confronted by enormous economic, social, political and educational challenges. According to Okeke (2014), these challenges, significantly affect the national efforts to institute sustainable development.

Formal education in Nigeria started with the missionaries in the 1840s. This brought about the Western system of education, which was embraced in the south while the north resisted it because of their Islamic culture and this resulted in an educational imbalance in the country (Fafunwa, 1974). The educational imbalance between the Northern part and the other regions is still a challenge to date (Ige, 2014). Nigeria and most African countries practised traditional religion before the advent of Western education in the continent of Africa. Traditional education philosophy of a people is premised on the thinking of the people, their beliefs, feelings and ways of carrying out duties in their society. The onus rests on the community elders to instil knowledge to the community through oral tradition, literature, ceremonies, poetry, and storytelling, although, parents have a part to play also. This type of education is seen as an informal education because it is received outside of the school standard set. It also has no outlined academic curriculum; neither are certificates of qualification issued for academic success. An individual continues to receive informal education through his/her lifetime. One of the benefits of informal education is that knowledge acquired is used for day to day human survival.

The Nigerian Government during the post-independence period in the 1960s got actively involved with the formal education institutions (Fafunwa, 1974). During this period, some states in the country took over schools, and this led to a broader coverage of educational opportunities in the country. As of 1967, all the twelve states (at the time) in the country had their educational policies with the curriculum reflecting the cultural and social demands of each state. During this period, both the Federal and the State governments shared responsibility for education in Nigeria in conformity with the 1963 constitution of the country (Aluede, 2006).

Accordingly, the 2014 edition of National Policy on Education highlights the following responsibilities of the Federal Government:

To be responsible for the determination of National Policy on mass literacy, adult and non-formal education

I. The Federal Ministry of Education should be the appropriate body to enter into dialogue with international donor agencies on the subject of cooperation in the sphere of mass literacy, adult and non-formal education

II. Coordinates mass literacy, adult and non-formal education programmes nation-wide

III. Ensures uniform standards and quality control nation-wide

IV. Liaises with national, non-governmental organisations and corporate bodies for the implementation of the mass literacy

V. Trains the required manpower for State Agencies

VI. Develops curricula and didactic materials for mass literacy, adult and non-formal education

VII. Provides a nationally recognised basic education certificate

While the State government is responsible:

i. To implement the national policy on mass literacy, adult and non-formal education in the states

ii. To plan, research, organise, develop, and manage States' mass literacy, adult and non-formal education programmes

iii. To monitor and ensure quality control of State programmes

iv. To set up and supervise the activities of literacy network committees in the state

v. To liaise with non-governmental organisations in the States for the implementation of the mass education programmes

vi. To train grass root personnel and

vii. To provide support services for adult and non-formal education including curriculum development, mobile and rural libraries, television viewing and audio-listening centres and studio-visual teaching and learning aids.

Then the Local Government Councils shall be responsible:

a. For day-to-day control and administration of local mass literacy and adult education programmes

b. For recruitment of part-time instructors and learners for functional literacy and post-literacy programmes

c. For feedback to the State and Federal Ministries of Education in respect of curriculum and material development techniques of teaching and evaluation procedures and the collection of data

d. To ensure that the literacy network committee at Local government district, village ward and centre levels, are operating efficiently and effectively

e. For the provision of physical facilities for rural libraries, reading rooms, television viewing centres and radio listeners' clubs.

In Nigeria today three levels of education exist, namely: primary education (6-12 years), secondary education (12 - 18 years: 3 years junior and three years senior secondary) and higher education (Polytechnics and Universities). According to Taiwo (1980), the Federal and State governments could independently establish and run higher education while the primary and secondary education was the sole responsibility of the state government. The constitutional amendment in 1972 gave the federal government exclusive responsibility for higher education while the state had the power to establish primary and secondary education. The Ministry of Education led by the Minister for Education was mandated to oversee the administration and control of education at both federal and state government levels.

1.1.9.1 Rivers State

Rivers State people are relatively literate with 2,805 government primary schools and 243 secondary schools. The past administration headed by Rotimi Amaechi from 2007 to 2015, built additional 500 new model primary schools and 23 new model secondary schools in a bid to avoid the collapse of the educational system in the State. Also, it

employed about 3000 new teachers; re-equipped the libraries and laboratories (Rivers State, 2015). The secondary schools in the State are concentrated mainly in Local Government Area (LGA) Headquarters. The tertiary institutions include a Federal University, a State University, a School of Health Technology, a Federal College of Education, two State-owned Polytechnics, a Federal Polytechnic of Oil and Gas, and School of Nursing and Midwifery.

The recent improvements achieved by the educational sector in Rivers State by the Rotimi Amaechi administration has earned the State an award by the Nigeria Universal Basic Education Commission (UBEC), as the best-performing State in the country in terms of education (MoE, 2013). The government also ensured high budgetary allocations to the sector. These Schools are well equipped with state-of-the-art facilities including internet, library, sports facilities, sickbay and solar powered energy systems (MoE, 2013). The government initiated a re-training scheme for all teachers in the State to ensure the required teaching standards are being met. This retraining scheme was done in conjunction with the British Council to upgrade the educational system to internationally approved standards. The government also upgraded the Colleges of Education and the State University (Adekunle, 2012 April 7).

In Rivers State, primary and secondary education are free to enable the citizens to be educated irrespective of financial status. The State government believes that an educated nation is a developed nation.

Rivers State is one of the States that make up the Niger-Delta region of Nigeria, situated in the southern part of Nigeria (see fig 1). Nine of the thirty-six States in Nigeria make up the Niger-Delta regions. The region is located at the base of the River Niger in the south-south of Nigeria (fig 1). The states of the Niger- Delta are the major producers of oil in the country. Rivers State is bounded on the south by the Atlantic Ocean, to the north by the Anambra, Imo and Abia States, to the east by Akwa Ibom State and to the west by the Bayelsa and Delta States (Ite, Ibok, Ite and, Petters, 2013). According to the 2006 national census, the population of the State was over 5.1 million (NPC, 2016). There are 23 local government areas in the State, with agriculture being the main occupation of the people of Rivers State and employs school leavers. However, the discovery of crude oil has made the production of oil and gas most famous in the State. Rivers State accounts for more than 40% of Nigeria

crude oil production. Because of oil exploration activities in the State, there are many petrochemical related industries running today. The State also harbours two out of the three major petroleum refineries in Nigeria and a large Liquefied Gas Project. The State has two major seaports and various industrial estates. Other natural resources found within its boundaries are Silica sand, glass sand and clay (Ite et al., 2013).

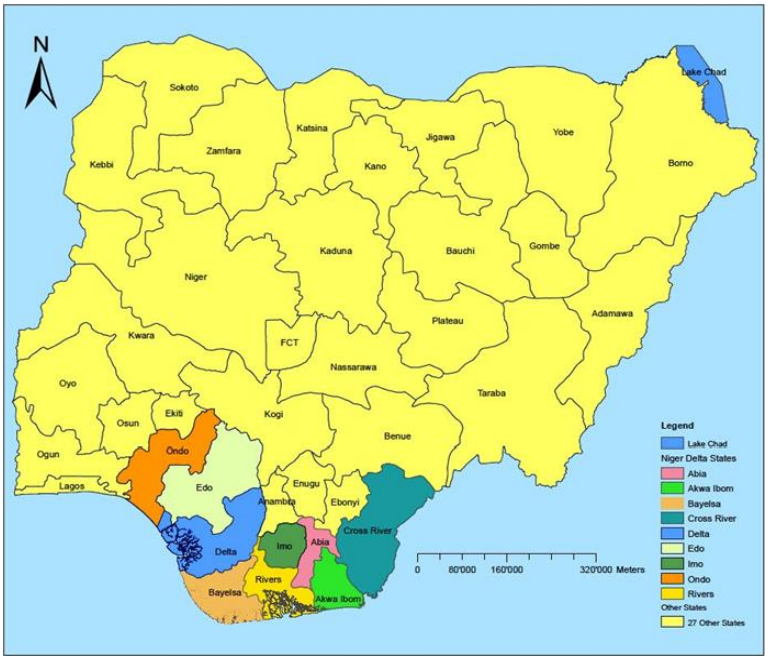

Figure 1: map of Nigeria showing the Niger- delta region in various colours, (Ite et al., 2013).

1.1.9.2 Education Policy Making and Curriculum Development in Nigeria

The national policy on education, first published in 1977, was to spell out in clear terms the philosophy and objectives of education in Nigeria. These philosophy and objectives are;

Philosophy

- Live in unity and harmony as one indivisible, indissoluble, democratic and sovereign nation founded on the principles of freedom, equality and justice;
- Promote inter-African solidarity and world peace through understanding

Objectives

- A free and democratic society;

- A just and egalitarian society;
- A great and dynamic economy;
- A land full of bright opportunities for all citizens

(N.P.E, 2004 p.1)

Prior to 1977, Nigeria education policy was based on the British education policy. After independence, the Nigerian government felt the British education policy could not satisfy the national aspiration of the country and therefore rendered the policy invalid. A national curriculum conference was held in 1973 to review the inherited curriculum and policy and then identify new goals for Nigeria's education. This conference was organised by the National Education Research and Development Council (NERDC) and produced the first edition of National Policy on Education in 1977 (Okoroma, 2000; Akagbou, 1985). After the first edition of the education policy, there has been an improved 2nd edition published in 1981, 3rd edition in 1998, and now there is a new edition published in 2004. This fourth edition became necessary due to the advent of some policy innovation and changes that became necessary to enhance good quality education delivery. Some of these innovative and changes are:

- In pre-primary schools, there shall not be more than 20 pupils to a teacher and a helper (assistant);
- In primary and secondary schools, there shall not be more than 35 and 40 pupils respectively in a class; (FGN, 2004 pg. iii).

Initially, Nigeria was running a 6-5-4 educational system, later moved to a 6-3-3-4 educational system but presently running a 9-3-4 educational system (6 years in primary, three years each in both junior and secondary levels, and four years in tertiary institutions). In the 6-5-4 and 6-3-3-4 systems, pupils at the end of 6 years of primary education write a certificate examination – the First School Leaving Certificate examination (FSLC). This was scrapped with the introduction of the Universal Basic Education which merged the first 6 and three years to the nine years of Basic compulsory education. The first nine years is compulsory and free

The philosophy and objectives on which these education policies were drawn conform to the basic principles and values of sustainable development. Therefore, after the first nine years of compulsory education, a child can decide to continue with the senior secondary or go for vocational training to learn skills. In either way, the knowledge gained may help the child make an informed decision, which is one of the objectives of ESD.

Nigerian Educational Research and Development Council (NERDC), the body in charge of developing curriculum for Nigerian schools, has a framework, which sets out the subjects within the broader context and shows how learning experiences within the subject need, contribute to the attainment of wider goals. Curricula include goals, explicitly addressed in the form of a scope and sequence of skills to be addressed; methods, the specific instructional methods for teachers (often described in a teacher's edition); material, the media and tools that are used for teaching and learning; and assessment, the reason for and methods of measuring student progress (see appendix 1.2).

1.2 Purpose of the study

The purpose of this research is to ascertain the potential for Nigerian secondary schools to contribute to national sustainable development through the provision of education for sustainable development (ESD).

1.2.1 Objectives

- Investigating the policy and practise of education for sustainable development in junior secondary education in Rivers State, Nigeria.
- Reflecting on how appropriate the Whole School Approach (WSA) model for ESD is for junior secondary education in Rivers State

1.2.2 Research question

- Does ESD in Nigerian secondary schools have potential to contribute to national sustainable development?

- Could the Whole School Approach to ESD work in secondary education in Rivers State, Nigeria?

1.2.3 Rationale

This study was initiated during my first visit to England for a Master's degree programme. Being a citizen of Nigeria and having studied in Nigeria up to my undergraduate level, I noticed a contrast between England and my home country in terms of development and management of resources. My postgraduate studies gave me the opportunity of leaving my home country for the first time. Problems such as poverty, flooding, environmental pollution, corruption, and uneven income distribution are high in Nigeria. The World Bank records indicated that Nigeria is among the five countries with the highest population living in extreme poverty. As the average income of an individual is ($1.25/day), also, the country accounts for 40 percent of malaria mortality worldwide (WHO, 2015). Another report from the United Nations, published in 2015, specified that nearly 60 percent of the world's 1 billion extremely poor people lived in just five countries in 2011: India, Nigeria, China, Bangladesh and the Democratic Republic of the Congo (UN, 2015). An overview of the poverty profile in Nigeria showed that in 2004, Nigeria's relative poverty measurement stood at 54.4%, but increased to 69% in 2010. This implied that 54.7% of Nigerians were living in poverty in 2004. Unfortunately, the figure has increased to 60.9% (National Bureau of Statistics, 2010). Nigerian cities have experienced flood in a drastic and tremendous manner such that the occurrence has doubled in intensity over the past ten years (Adejumo and Adejumo, 2014; Adams, Fufeyin, Okoro, and Ehinomen, 2015). Numerous challenges hindered the country from achieving the target of the Millennium Development Goals, however, a set of eight Sustainable Development Goals was adopted by the United Nations which were to eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria, and other diseases; ensure environmental sustainability; and develop a global partnership for development.

It is evident that Nigeria was unable to meet with the 2015 MDG's target (Oleribe and Taylor-Robinson, 2016). From the review of related literature about sustainable

development and ESD, it was discovered from this study that there was no substantial research on the impact of sustainable development knowledge in Nigeria through education, even as the decade of Education for Sustainable Development (DESD), (2005 -2015) has come to an end. Therefore, the rationale for this study has addressed the gap in research by investigating the Nigerian secondary education sector to evaluate its readiness to achieve Sustainable Development Goals target for 2030. In this regard, this research offers a comprehensive understanding of ESD in a Nigerian context by scrutinising secondary curricula for evidence of ESD, and by carrying out in-depth case-studies in two urban and two rural secondary schools in Rivers state.

1.3. The Structure of the Thesis

This thesis is divided into seven chapters. Chapter one has given an account of the research aims, objectives, research questions and the rationale for the study, alongside contextualising background information.

In chapter two, a critical review of the literature on sustainable development and education for sustainable development, which is relevant to the research topic was discussed. Chapter three is a continuation of literature review but focuses on the theoretical framework guiding this study- whole school approach to sustainability. This framework is one of the models of ESD, which looks at a way of creating awareness for sustainable living through schools by involving the communities around the schools.

Chapter four deals with the philosophical and methodological framework for the case study. It offers a detailed account of the adoption of the research methods and the analytical techniques used in analysing the findings of the data gathered. Chapter five presents the findings of the fieldwork. A detailed description of the schools used for the study is given in this chapter. Chapter six deals with the discussion of the findings in relation to the relevant literature reviewed, to answer the research questions and to meet the objective of the study. Chapter seven reflects on the findings of this study and provides a conclusion based on the findings. The chapter finishes with recommendations for improvements in the education systems in Nigeria and future research. The findings of this study appear to have some implications on pedagogy, the role of teachers in sustainable development learning, the government and ESD

stakeholders for example UNESCO. The chapter ends with a reflection on the research methods with an investigation of the limitations of the research.

Chapter Two – Literature Review

2.0. Introduction

This chapter begins by synthesising and reviewing the literature about sustainable development as a concept. Sustainable development, as a concept, takes on different meanings depending on the context in which it is used. For this reason, this chapter discusses several descriptions of sustainable development. This is in acknowledgement of its complexity and furtherance of its understanding regarding the birth of Education for Sustainable Development (ESD). ESD is fundamentally the thrust of this study, and its primary focus is to empirically investigate the potential of the provision of education for sustainable development in junior secondary schools in Rivers State Nigeria and to try to explore the State's potentials in achieving 2030 United Nations' agenda for Sustainable Development Goals (SDGs). Sustainable Development is a novel concept that creates a system that takes the finite resources of the earth into consideration. Therefore, this chapter examines different scholarly viewpoints and models of sustainable development that gave birth to ESD. The concept of sustainable development and its complexity are extensively discussed, then followed by its pillars as well as the models – these are the most essential components of sustainable development. In addition, the chapter examines Education for Sustainable Development (ESD). It further discusses the objectives of ESD and the postulated theories on the role education plays, and the teaching techniques employed to effectively drive the objectives of ESD. Finally, the challenges and barriers to implementation of ESD are discussed.

2.1 Sustainable Development

This section discusses the origin and development of sustainable development as a concept. Sustainable development as a concept has been a topical issue of serious engagement in academic papers presented and has a focus at sensitising the societies (local, national and international authorities) that our present living and consumption patterns may lead to lack of resources sooner than can ever be imagined.

This discussion brings the understanding of the situation and motivates actions leading to the conceptualisation of sustainable development.

Sustainable development as a concept emerged from series of conferences and summits held by stakeholders as discussed in chapter one, during which they have tried to agree how to tackle some of the burning issues such as poverty, increasing inequality, environmental and human health degradation of this century. The 1972 conference in Stockholm, Sweden on Human Environment was the very first international conference where environmental issues formed the major discussions (Paul, 2008). The 1972 conference was attended by 113 states and representatives from 19 international organizations. During the conference, the industrialized as well as the developing nations came together to delineate the 'right' of humans to healthy and productive environments by articulating the links between environment and development (Mebratu, 1998; Robinson, 2004; White, 2013; Holden, Linnerud, and Banister, 2014; Hak, Janouskova, and Moldan, 2016). Furthermore, they identified the conflicts between environmental and economic priorities. The conference gave birth to the creation of the United Nations Environmental Program (UNEP). The function of this body is to provide leadership and encourage partnership in caring for the environment by inspiring, informing and empowering nations to improve their citizens' quality of life without compromising that of the future generations (Vogler, 2007). After the 1972 conference, the UN General assembly created the World Commission on Environment and Development (WCED) in 1983. The WCED is well-known as the Brundtland Commission, named after its chairman, Gro Harlem Brundtland, the then Prime Minister of Norway (Brundtland, 1985). Four years after (1987), the commission published the Brundtland report, commonly referred to as 'Our Common Future' (Brundtland and Khalid, 1987). This report was built upon the achievements of Stockholm Summit and provided the most widely accepted and applied definitions of sustainable development: "sustainable development is the development that meets the needs of the present without compromising the ability of the future generations to meet their own needs" (Brundtland and Khalid, 1987 p.41). Other summits and conferences followed as indicated in section 1.1.2 of chapter one.

The Brundtland Report elicited discussions on how sustainable development is understood in contemporary societies. However, concerns about the negative impact of humanity on the environment are not new. For example, in 1798 Thomas Robert

Malthus wrote an essay on the principles of a population (Paul, 2008). Thomas Robert Malthus was a demographer, a political economist and pastor in England. In his essay, he predicted that the world's population would eventually starve or at the least be at a minimal level of subsistence because food production would not keep pace with the growth of population. Berck, Levy and, Chowdhury (2012) was of the opinion that Malthus' concern about population growth was that, if unchecked, it would increase geometrically while subsistence for man would increase arithmetically. This implies that the rate of population growth will by far outstrip natural resources. So far, technological advances have proved him wrong because, in the North, better farming techniques, and the invention of new farming equipment and continuing improvements in agricultural science have made food to be in surplus (Tilman, Balzer, Hill, and Befort, 2011). Almost two centuries later, in 1970, an international team of researchers at the Massachusetts Institute of Technology (MIT) began a study on the implications of world population growth. The outcome of their research 'The Limits to Growth' upheld the ideas and prospects of Malthus (Meadows, Meadows, Randers and, Behrens 1972). Their research concluded that even with the advancement in technology, the global system of nature in which we live in might not be able to support present rates of economic and population growth much beyond the year 2100. The results of the computer-based simulations of MIT exposed the depletion of non-renewable resources and increases in commodity prices as a result of an exponential increase in population and industrial capital, with a corresponding growth in pollution, demand for food and non-renewable resources (Meadows et al., 1972). The proposed solution in 'The Limits to Growth' is a type of society in which population and production are limited and pari - passu; that is, a sustainable society. However, they suggested that humanity could create a society in which they can live indefinitely on earth if they impose limits on themselves and their production of material goods to achieve a state of global equilibrium with population and production.

Lester Brown, another Malthusian, has published numerous books and articles explaining the troubles he had predicted humankind would face due to advancement in technology (development) when earth's fossil fuel reserves are depleted. Consequently, Brown in 1974 set up duo institutes namely, World Watch and Earth Policy Institutes, in regards to the global use of natural resources and viable alternatives for our consumption trends (Brown, 2006).

Recently, a group of environmental scientists led by Johan Rockstrom came up with evidence that biophysical thresholds exist and that resource control is one of the world's most significant needs for prosperity (Rockstrom, 2009). These scientists suggested that human beings have to live within nine specific limits to keep the earth hospitable. These limits are to ensure that the atmospheric concentrations of carbon dioxide are no more than 350 ppm, keeping biodiversity at 90% level, as lost biodiversity and 75% of planet's original forests become extinct. They also suggested that emission of aerosols into the atmosphere should be checked, stratospheric ozone depletion, ocean acidification, the use of phosphorus, nitrogen in farming, freshwater use and dumping of organic pollutants, radioactive materials, nanomaterials, micro-plastics and other human-made substances into the world's environment should equally be controlled. Consequently, in a review of the work of some scientists across the globe as well as the Intergovernmental Panel on Climate Change (IPCC). Reported that, human activities have brought about a change in the planet's climate, have increased the frequency and intensity of heat waves, have led to heavy rainfall, flooding, droughts, intense tropical cyclones, rising sea levels and loss of biodiversity.

It is discovered from the above, that the Anthropocene era has impacted on the planet's environmental quality and stability negatively. The essence of these reports is to define a safe operating space for human societies to develop and thrive, based on humans' understanding of the functioning and resilience of the earth's system. Even with the present awareness of global issues, solutions are yet to be found. This may be as a result of different perceptions and dimensions of sustainability.

2.1.1. Different interpretations of Sustainable Development

As a concept, 'sustainable development' has been criticised as being complicated, dubious, multi-faceted and contestable, (Rauch, 2002; Sauve,1996). However, this section attempts to unravel, sustainable development as a contestable concept.

Arguably, two steps to sustainable development are, theory and practice. In the transition from theory to practice, many complex challenges may be encountered because as a theory (or concept) sustainable development is defined with inadequate clarity or precision. stated that, "as a matter of practice, sustainable development is

presently used in varied ways by different people to the extent that its meaning creates confusion and cynicism as favourable environmental change". McKeown, (2002 p.7), also commented that while it is not hard to identify what is unsustainable around us, 'we have difficulty envisioning a sustainable world because we lack a clear definition of sustainability'. The term 'sustainable development' is frequently used, yet it is quite often misunderstood and misused in different ways by different groups and communities, (Mawhinney, 2002; McKeown, 2002).

Christen and Schmidt (2012) opined that Brundtland's definition of sustainable development does not allow explicit instruction on the concept because societies, as well as nature, are known to be a dynamic system. Secondly, from a social justice point of view, they feel that Brundtland's definition of sustainable development is guilty of paternalism and it is normatively understood because the definition of the concept prescribes the concrete objectives of development. To achieve a sound basis for the concept of sustainable development, they advocated that the concept should be embedded in a broader context so that the principles of the concept can be known to allow for its transformational practice by not only querying 'what is to be sustained?' however, also 'how it can be sustained?' In that way, one obtains a comprehensive and well-founded understanding of sustainability, in which its connections to other notions such as justice, needs, and eco-services are enhanced.

Meanwhile, Ngwakwe (2012) advocated that the concept of sustainable development as defined by Brundtland mark the formal beginning of a global environmental campaign encapsulating all facets of ethics, to restrain extreme human activity on the environment, society and culture. Accordingly, to Ngwakwe (2012), in the context of sustainable development, the ecological balance has deep meaning. It seeks to synchronise economic growth, social equity and environmental sustainability as against the earlier claim that ecological balance is linked to economic growth. In agreement with the Brundtland's definition of sustainable development, Ngwakwe (2012), stipulated that human activity since 1800 has resulted in the emission of a high volume of gaseous materials into the atmosphere. Subsequently, corporate environmental sustainability has gained thrust with the vision that it would enrich corporate eco-efficiency in corporate operations by using less environmental resources, which implies the necessity for businesses to reduce environmental pressure per unit produced and consumed.

Even though many researchers have articulated concerns for the various definitions of 'sustainable development', they are not in agreement with its implementation. Other schools of thought have also argued that it is of no significance to have a unified definition, UNESCO (2005a). To buttress this point, numerous professionals have supported the position that varied definitions of sustainable development are a constructive way of charting the way to reaching the goals of sustainable future. This second school of thought rejects the idea that the varied and sometimes contradicting definitions of the term 'sustainable development' is a problem. Instead, the nebulous and wide range of understanding of the term enables a solid footing for professionals to have a far-reaching process of understanding the phenomena (Khataybeha, Subbarinia & Shurmana, 2010) which may also provide an environment for creativity, with the aim of achieving the same goals (Rauch, 2002 p.48). 'Sustainable development' relates to a process of change, which leads to a possible evolvement of its meanings depending on local contexts. UNESCO (2005a) and the ambiguity of the term allows 'a considerable consensus to be reached in support of the idea that it is both morally and economically wrong to treat the world as a business in liquidation' (Daly, 1991 p.223). Moreover, Sauve (1996) called for a critical reflection of the underlying issues which is aimed at helping to develop relevant ideas and adapting them into different situations and scales. Inherently, attention to sustainable development has consistently been on the global agenda. For example, the UN has been the major drive, though not the only one. Solutions are being proffered, for example, by Agenda 21, DESD, MDG to SDG and Agenda 2030, however, solutions have limited successes, while the global community with an awareness for the need for sustainable development is tenacious.

2.1.2 Pillars of Sustainable Development

Sustainable development as a concept explicitly conveys three principal aspects or pillars: environmental protection, economic stability and just society, (Giddings, Hopwood, and O'Brien, 2002). 'Culture' is sometimes added as the fourth aspect of sustainable development (Lele, 1991) and at other times it is mixed with socialisation. This aspect of the discussions examines the different ways in which sustainable

development is and has been conceptualised. For a thorough understanding of the real meanings of sustainable development in the context of ESD, it is crucial to conceptualise it.

2.1.2.1 Environmental Protection

Environmental protection refers to the protection of ecological processes and the integrity of the biosphere which provides the resources and the environment on which other human activities subsist. Dailianis (2011), defines environmental protection as protection against the anthropogenic activities that threaten the integrity of the ecosystem, and the environmental processes occurring within it, that the societal and economic activities depend on. Harris (2003) corroborated the above view by explaining that an environmentally sustainable system needs to maintain a stable resources base. This implies that to avoid over-exploitation of renewable resources systems leading to depletion, investments in sustainable non-renewable resources substitutes is the answer. Contrary to Dailianis's (2011) opinion, Hartwick (1977) is of the view that natural capital, for example, soils and natural resources and environmental services of the planet, need not be preserved as long as these resources are reinvested in the reproductive capital. This rule is in support of weak sustainability where the economic pillar is considered more important than the other pillars. According to Adejumo and Adejumo (2014), the Nigerian government is not as much concerned about the environmental degradation caused by the activities of the oil companies in the Niger–Delta Region as they are with the economic gains derivable therein. Therefore, maintenance of biodiversity, atmospheric stability and other ecosystem functions have to be considered (Roseland, 2000). Though market mechanisms often do not operate effectively to conserve natural capital but tend to deplete and degrade it. Ecologists advise that human population and total resource demand should be limited in scale and the integrity of the ecosystems and diversity of species maintained (Harris, 2003).

Environmental degradation is a significant challenge in Nigeria, as highlighted by Adejumo and Adejumo (2014). Issues such as oil spillage, crude oil contents, chemical substances such as sulphur, nitrogen, oxygen as well as hydrocarbon components affect living things, aquatic and plant lives. Gas flaring from the oil companies'

exploration activities, contribute to greenhouse gases which contain toxins and therefore exposes humans to diseases.

2.1.2.2 Economic Stability

A stable economy is an economy that does not create other significant economic problems like unemployment, especially for the future. Daly (1990) as opposed to Hartwick and Solow's rule. In his own opinion, "man-made and natural capital are fundamental complements and only marginally substitutes" (p.25). An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances which damage agricultural or industrial production. Economic sustainability requires that, as much as possible, all the different kinds of capital such as manufactured capital, natural capital, human and social capital, that make economic production must be conserved or augmented. Some substitutability may be possible with these capitals, but in broad terms, they are complementary, so that the maintenance of all four is essential in the long term.

Generally speaking, the Nigerian economy is facing significant challenges presently, because of its significant dependence on a single commodity that is crude oil, weak industrial base and private sector underdevelopment. Consequently, Daly (1994), emphasised that these have caused a high rate of unemployment and inflation. Therefore, to assuage the present economic instability in Nigeria, the country should employ diverse economic solutions that will continuously produce goods and services to maintain the country's financial and social needs.

2.1.2.3. A just society

According to Balaceanu, Apostol and, Penu, (2012), a just society is a call to break down the barriers of inequality by doing more to empower the developing nations. This idea is as a result of a perceived notion that the gap between the poorest and the wealthiest nations is very vast and growing. A system that is considered socially

sustainable should evolve equitable accessibility of opportunities, social services, health, educational facilities, gender equality, political culpability and involvement.

Ngwakwe (2012) said, one of the important principles in sustainable development dialogue is, equity which in policy terms, describes how welfare goods and opportunities are equitably allocated. This principle is, applicable to a country and global levels, where the term refers to the fairness in the provision of opportunities to survive and meet developmental goals to all individuals, irrespective of their gender, age, religious, affiliation and so on. This comprehensive conception of equity refers to a broad spectrum of policy areas, ranging from the provision of clean water, nutrition, employment, education, shelter, essential medicines, and an unpolluted environment, and access to social networks. Freedom from discrimination based on any condition cannot be excluded as Equity encourages non-discrimination. These Policy goals in the light of equity can be identified in every publication of the UN. Some social issues like inadequate provision of basic education, functional health care, employment for youths, clean water, security of life and properties are prevalent in Rivers State (Ite et al., 2013).

Though limits on population or restraint on consumption are important, sustainability is more than that. It means that the choice of goods and technologies used must be oriented to meet the requirements of ecosystem integrity and species diversity as well as social goals. Components of all three perspectives – economic, ecological, and social – are needed to understand the requirements for sustainability.

2.1.3 Models of Sustainable Development

The distinction between sustainable development and environmentalism is not always clear or understood. This could be the reasons sustainable development goals have been and continue to be hard to achieve (Giddings et al., 2002). The concept of sustainable development has continually been reformed and has produced new interpretations to the concept (evidenced by the different models described below). Key example: Green Economy is the most current way of conceptualising sustainable development. It gives equal treatment to the economy, society and environment.

2..1.3.1 Intersected Model

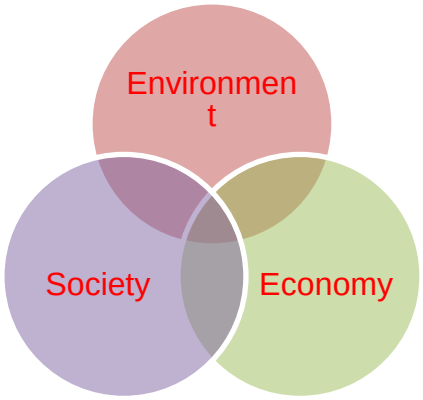

Figure 2.1: Intersected Model

(Adopted from Giddings et al., 2002)

The intersected model assumes the environment, economy and society in a symmetrical interconnection of three rings, see Fig 2.1 above. According to Hopwood, Mellor and O'Brien (2005), this model has a conceptual simplicity that makes analysis straightforward, as it encourages the classification of impacts into three suitable categories. The danger of its simplicity is that, if separated it can imply different perspectives and gives higher priority to one or the other, especially in the business setting as illustrated by Hopwood et al., (2005), Giddings et al., (2002), Diesendorf (2001). Economic consideration can often dominate environmental and societal considerations because governments' main concerns are typically economic growth used as an index to measure development. This is evident in the American government's initial refusal to accept a target for carbon dioxide emissions during President Bush's administration and the administration's refusal to sign the Biological Diversity convention due to the target's restrictive nature on economic concerns (Dresner, 2008). This refusal lasted until 2009 when the Obama administration considered the far-reaching impact on the environment agreed to comply. There has not been any clear stand by the present government on the Biological Diversity Convention.

Another likely danger of separating the fundamental connection between the environment, economy and society, is that it can lead to trade-offs between the three sectors thereby risking approaching sustainable development in a compartmentalised manner (Giddings et al., 2002). There are fears that this separation can lead to weak

sustainable development because it would be assumed that built capital can replace natural resources, therefore, underplaying the fundamental connections between the economy, society and environment. Ugboma (2015), argued that these disregards emphasise the fact that no amount of genetic engineering can replace biodiversity in the Niger - Delta region in Nigeria which suffers environmental degradation due to oil exploration. Unabated industrial wastes flow, oil spills, and gas flaring have led to huge pollution of farmlands and aquatic lives and biodiversity. This is a clear example of placing economic aspects of sustainable development over the other two aspects, in respect of the laws and decrees by the Nigerian government to control environmental pollution. The Niger Delta region generates and contributes over 60% of the national revenue to the Nigerian economy as recorded by Ugboma (2015) and yet suffers from under development. The welfare of the inhabitants is not considered of paramount importance despite the fact that Nigeria is a signatory to several conferences organised by the UN on sustainable development. The effect of separating these three aspects is that it encourages a technical fix approach to sustainable developmental issues, which if not well handled puts the nation into serious debts crisis. This model can imply that the three aspects of sustainable development are independent of each other. However, many published articles, like Kuehr (2007), Hopwood et al., (2005), Diesendorf (2001), Daly (1992), Barbier (1987), disagree with this opinion and argue that the three aspects of sustainable development should be seen as equal and dependant on one another. The nested model illustrates this interdependent approach:

2.1.3.2 Nested Model

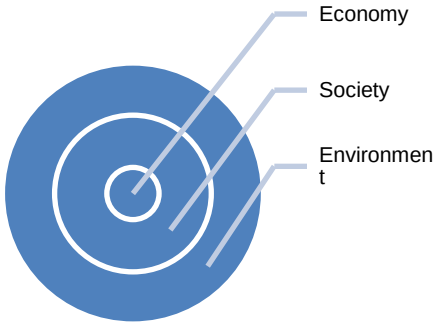

Figure 2.2: Nested Model

Adopted from Giddings et al (2002)

The nested model shows that the economic aspect of sustainable development is dependent on the society and environment as shown in Fig. 2.2 above. Governments and business owners are gradually becoming more conscious of the impacts of business activities on the environment (Zaharia, Zaharia and Tudorescu, 2010). These activities have resulted in problems such as damage to biodiversity, pollution and loss of attractive landscapes as in the case of Niger Delta, as earlier discussed. These impacts have remained unpaid for and will continue to remain so, as long as the harmful ways in which business and human activities are carried out are not addressed, that is, how a business compensates for damage to health or loss of habitat. This awareness of interconnections of society and the environment brought about the nested model which was designed in 1994 by the International Union for the Conservation of Nature (IUCN). This model demonstrates that people exist and subsist within the ecosystem; the people and the ecosystem are dependent on each other. The model acknowledges that human activities (society) take place within the environment. As stated by Hopwood et al., (2005), almost all our activities as humans affect the environment because our needs such as clothing, food, medicines, light and heat are made with materials and energy that come from the environment.

Kuehr (2007), stressed that implementation of the nested model in any country could attain economic development while maintaining a sustainable society through the process of zero emission. Zero emission as defined by Kuehr (2007) is the act of reducing waste and harmful emissions to zero and making financial gain in the process, thereby preserving the natural resources as well as preventing damaging impact on the environment. The process primarily ensures that the intake of natural resources within renewable limits and final emissions are within acceptable limits. In agreement with Kuehr (2007), Lozano (2012), highlighted that economic sustainability was not possible unless guided by environmental sustainability principles and geared towards the achievement of sustainable livelihood and societies. The economic aspect of sustainability, therefore, should involve ecological economics where cultural, monetary/financial and social aspects are integrated. The debate over which of the pillars should be given a higher priority brought about the concept of ‘green economy’ to birth.

2.2 Education for Sustainable Development

Education, besides being a fundamental right of every individual is critical for promoting sustainable development and improving the capacity of an individual to address environmental and developmental issues as postulated by Sterling (2014). Charter and Tischner (2017), had pointed out that, due to the complexity of sustainable development, it cannot be achieved by technological solutions, political regulations or financial instruments alone. Rather it could only be realised using a holistic approach by changing the way we think and act by and using education to develop new policies and practises, that enhance sustainable development at all levels and social contexts.

The concept of ESD is linked to the 1992 conference, organised by the United Nations Conference on Environment and Development (UNCED), with 178 member states in attendance (UN,1992). The conference produced the first international document called Agenda 21. Chapter 36 of the said document recognised education, training and public awareness, as critical tools for the transition to sustainable development, and calls for education to be re-oriented towards sustainable development, (UN, 1992). United Nations Educational, Scientific and Cultural Organisation (UNESCO), a body of UN was, assigned to manage this mission. The Agenda 21 principles and framework underpins the conceptual thinking and planning for ESD, from global levels through to regional actions and local initiatives. The UN general assembly then declared 2005 to 2014 as, the Decade of Education for Sustainable Development (DESD). The DESD is aimed at integrating the principles, values and practices of sustainable development into all aspects of education and learning that would encourage changes in behaviour which might lead to a more sustainable future in terms of environmental integrity, economic viability and a just society for present and future generations. According to Karatzoglou (2013), all educational levels are meant to be involved in contributing to ESD during the period of DESD, because the period was designed for preparing citizens to be responsible both now and in the future, to shape the society sustainably. This initiative according to Leo and Wickenberg (2013), had resulted in the formulation of the goals of education in international policy documents as well as the national and local curricula. “Education for Sustainable Development (ESD) is a vision of education that seeks to empower people to assume responsibility for creating a sustainable future. It aims at improving access to quality

basic education, reorienting education curricula, training and raising public awareness as well as helping people to develop the behaviours, skills and knowledge they need, now and in the future", UNESCO (2015).

UNESCO's vision for ESD is to enable people to address present and future global challenges constructively and creatively, to build more sustainable and resilient societies. It advocates education that can empower learners to make informed decisions and responsible actions for environmental integrity, economic viability and a just society for both intragenerational and intergenerational equity while respecting cultural diversity. This method of education should have a comprehensive approach to educational reform because it would extend outside of school subjects and call for the attention of teachers, educational administrators and curriculum planners and developers. ESD is not a new programme, rather a clarion call for educational policies, programmes and practices to be re-oriented so that education can play its part in building the capacities of all members of the society to work together to build a sustainable future, (Nevin, 2008). UNESCO was tasked to be the lead Agency, through the adoption of a resolution 57/254, in 2002 (Karatzoglou, 2013). The purpose of the DESD was to ensure that all member states, included measures to implement the objectives within the given time frame, in their respective educational strategies and action plans. An International Implementation Scheme (IIS), was put in place by UNESCO, to promote ESD. The IIS was built on four thrusts of ESD, and seven strategies. These thrusts and strategies are explained below (Education Funding Agency (EFA), 2015).

Improving access and Retention in Quality Basic Education

The priority of ESD is to increase basic literacy merely. Basic literacy though means different things to different countries. In some countries, primary school is termed as basic education, while, it is obligatory to finish eight or twelve years before one can be considered as completed basic education. In other countries also, reading and writing are considered as basic education, so long as a child can read, write letters and develop skills necessary to fulfil their expected roles in their household and community. EFA (2015) observed for instance that a girl might learn nutrition and nursing and it is considered basic education; in Nigeria, basic literacy means the first nine years of formal education.

Re-orienting Existing Educational Programmes to address Sustainability

It is important to state that the international community has recognised the need to address the issues of sustainability through the re-orientation of basic education as ESD integrates the three pillars of sustainable development (environment, economy and society). The reason for this re-orientation is because education encourages teaching and learning knowledge, skills, perspectives, and values which in turn guide and motivate students to pursue sustainable livelihoods. Education also enables people to participate in a democratic society, as well as live sustainably.

Increasing Public understanding and awareness of Sustainability

The argument for increasing public understanding and awareness of sustainability initiative stems from the belief that all facets of the society must be involved for environmental change to occur. This involvement includes providing training aimed at advancing Sustainability across all Sectors.

UNESCO employed two complementary approaches to promotion in advancing the DESD. First, it supported the education community in the transition to sustainable development and second, it supports stakeholders who work on sustainable development to incorporate education into their work. These were achieved through:

- Advocating with the UNESCO Member States and across the UN system on education as a critical implementation tool for sustainable development, reaching out to both education and sustainable development communities;

- They also provided policy support and advice to the Member States, using the lens of ESD to re-orient their education systems and to progress towards and attain the MDGs and EFA commitments;

- Championing a global debate on ESD through networking and interaction among stakeholders in ESD, thereby promoting exchange between practitioners and experts around the world;

- Developing approaches for the assessment of progress in ESD.

During the first three years of DESD (2005 – 2008), UNESCO invested in defining and promoting ESD, by identifying actors and activities already underway. UNESCO also developed networks and partnerships by putting up monitoring and evaluation

mechanisms in place. The second phase of the DESD marked by the 2009 World Conference on Education for Sustainable Development led to a turning point where the emphasis shifted towards a renewed focus on advancing ESD in the context of quality education. This emphasis was on the need to focus on teaching, learning and content and the relevance of education to work and life. In fact, ESD was seen as primarily related to the re-orientation of formal curriculum and sustainable development content in the early days of the DESD. Inherently, at the end of the DESD, a better understanding of the process of ESD led to exploration and the implementation of new forms of teaching and learning, across all sectors and interests (UNESCO, 2012).

2.2.1 The milestones of the DESD

Milestone	Year achieved	Summary of achievement
Rio Earth Summit.	1992	Agenda 21, a global action programme for sustainable development was adopted by 178 governments, with emphasis on chapter 36.
World Education Forum and the UN millennium Summit.	2000	The education forum was where the international community affirmed its commitment to achieving Education for All (EFA), while the UN summit saw the largest gathering of world leaders in history to set the MDGs goals.
World Summit on Sustainable Development and 57th UN general assembly.	2002	The 1992 Earth Summit was, reviewed and UN DESD was declared.
United Nations Literacy Decade, UNLD (2003, 2012)	2003	To support collective effort in achieving the EFA goal by 2015.
Launch on the DESD in all the continents of the world.	2005	
Fourth International Conference on Environmental; Education	2007	To check the current status of environmental education.

Towards a Sustainable Future.		
Mid-DESD conference.	2009	Bonn Declaration.

The review of the period of DESD, shows that ESD was understood as primarily related to the re-orientation of formal curriculum and sustainable development content, therefore, the first four years (2005 – 2008) of the decade, were invested in defining and promoting ESD as well as, identifying actors and activities already underway, developing networks and partnerships and putting monitoring and evaluation mechanisms in place. At the second phase (2009 – 2014), a better understanding of the process of ESD led to exploration and the implementation of new forms of teaching and learning content and the relevance of education to work and life. In 2009 at the World Conference on Education for Sustainable Development, emphasis shifted towards a renewed focus on advancing ESD in the context of qualitative education. The Bonn Declaration was based on the outcome of 2009 World Conference on Education for Sustainable Development, and a newly elaborated Strategy for the second phase of the decade. UNESCO focused on three critical sustainable development issues: Climate Change, Biodiversity and Disaster Risk Reduction to be addressed through education. This strategy, guided the second phase of UN DESD as noted by UNESCO (2012). The result of the DESD was that changes in curricula contents that shape knowledge of sustainable development started to emerge. There were visible changes in learning approaches that improve the attainment of knowledge, abilities for sustainability and outcomes, to learners' participation and engagement in learning, that are relevant to their future as global citizens (UNESCO, 2012).

An overview of the DESD revealed that Member states began to re-orient their educational systems to address a wide range of sustainable development challenges, using more collaborative, critical inquiry and problem-solving approaches, in their learning process. Nigeria, under the administration of President Olusegun Obasanjo in 2009, re-oriented the curricula of both secondary and primary education to address local sustainable development issues (MoE, 2015).

2.2.2 Objectives of ESD

The 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro, acknowledged the crucial role of education in, achieving sustainable development, through Chapter 36 of its outcome document Agenda 21. ESD is seen as the key facilitator, for sustainable development and an integral element of quality education. The objectives of ESD are to link learning to real life experiences; therefore, it aims at promoting competencies like critical thinking, imagining future scenarios and making decisions in an individual to allow informed decision to be made. ESD aims to build attitudes and values of individuals in the society to care for their community; show respect for the beliefs and opinion of others in the community; develop individual skills that allow for expression of views; collect information clearly and concisely; identify causes and consequences of problems, and form reasoned opinions.

The objectives behind ESD are to ensure that values inherent in sustainable development are integrated into all aspects and levels of learning. This would enable learners to develop general skills in connecting and linking subjects which can be transferred to any practical situation.

2.2.3. The Role of Education in Promoting Sustainable Development

Figure 2.3: SDGS

Adopted from European Environmental Bureau, EEB (2016).

Section 1.1.3 of chapter one, introduced the Sustainable Development Goals (SDGs). The goals which were built on the three dimensions of sustainable development are universal and transformative, and as discussed earlier, the goals are interconnected. This implies that success in one may affect the success of the other adversely and vice versa. This section discusses the role Goals 4 (SDG4), “quality education” can play in achieving the other SDGs.

The SDGs are a new set of goals adopted by the UN member states in as a framework to be explored by the various governments for their agenda and political policies over the next 13 years. It is also an extension of the Millennium Development Goals (MDGs). The UN conducted series of consultations to gauge opinions on what the SDGs should include. These goals were the outcome of Rio+20 Summit 2012, where the goals were drafted. Also, in September 2015, at the 70th session of the UN General Assembly, the 17 SDGs as shown in Fig. 2.3, were adopted. These goals differ from MDGs because the goals are universal, unlike the MDGs that was centred only on developing countries. In addition, the goals address the causes of poverty which is the most significant global challenges. A core feature of the SDGs is the intense focus on the means of implementation, and this is where education comes into play.

It is believed that millions of people could be lifted out of poverty if they acquired necessary reading skills because they could then make a living on their own and not necessarily depend on government for every support (UNESCO, 2015). The report from United Nations Development Programme (UNDP) and World Bank indicated that increased access to education benefited worse off groups by raising their income (Ganimian and Murnane, 2016). Research conducted by the United Nations, UNDP, and World Bank, has proven that educating a girl-child can avert an intergenerational transmission of poverty. By breaking the cycle of early marriage, childbearing, health and other risks associated with these events (Ganimian and Murnane, 2016). Education plays vital roles in achieving the second SDGs goal, which is to ‘End Hunger’. The first aspect of education is the basic agricultural education which develops the producers’ skills and competencies thereby increasing productivity. The

second aspect is that basic literacy improves the nutritional food intake of an individual as indicated by UNESCO (2014). Furthermore, a child whose mother is literate is 50% more likely to live longer than age five, thereby reducing child mortality especially in the southern part of Nigeria. The report also indicated that educated people are better informed about diseases, take preventive measures, recognise signs of illness early and tend to use health care services UNESCO (2014). Accordingly, World Health Organisation (WHO) reported that the impact of education was notably stronger for women, because it resulted in better health outcome for them and their children WHO (2009).

It also accelerates their countries' transition to stable population growth, UNESCO (2014). In achieving the fourth SDG, UNESCO has advocated for curriculum re-orientation, for greater capacity to educate others and nurture a culture that values learning. They have encouraged gender equality, especially in developing countries, because a World Bank report revealed that, a woman's earning can be increased by one additional school year. Therefore, empowering women and girls through education would also help in alleviating poverty (Ganimian and Murnane, 2016).

As discussed in section (2.6), ESD is not just about formal education, it also involves informal (through training) and non-formal (through media) education. As a community becomes well-informed on the connection between sanitation and health through education, they can now begin to appreciate the need to continuously improve on sanitation viz-a-viz improvement on their health, and the further management of the natural resources like water, around them. Furthermore, the community needs to ensure efficient use of energy, knowing the consequences of using fossil energy that pollute the environment with noxious gases. World Bank report indicated that, with education, people are more likely to apply creative solutions that ensured sustainable cities and communities are in place (Ganimian and Murnane, 2016). Education also ensures that people use energy and water more efficiently and recycle household waste. This will help to protect the planet further, and with higher levels of education, people or societies across the globe will show greater concern about the well-being of the environment. Moreover, UNESCO reported that each additional year of schooling increases average annual gross domestic product (GDP) by 0.37%, which consequently leads to provision of good jobs and economic growth. According to the same report, another benefit is an increase in enrolment rate in secondary education

by 10% with the consequent reduction in the risk of war by 3%. The global partnership for education is a prominent example of how collaborative partnership can enhance progress in education and the development of other sectors.

In summary, the role of education in the achievement of sustainable development cannot be over-emphasised. This section has presented how education contributes to the achievement of SDGs however, the realisation of this depends on the prioritisation of education. This is the reason UNESCO is making an effort to ensure that developing countries most particularly, provide quality education to their citizenry by re-orienting the curriculum content of both teacher education and schools.

2.2.4. ESD Teaching Approach

The DESD decade revealed that specific key teaching and learning processes underpin the ESD framework and practices. These processes include active and participatory learning, processes that engage whole system teaching and learning (UNESCO, 2011), although Hoffmann (2014) stated that teaching methods were vehicles to achieving an intended learning process. In this regard, this section discussed two teaching techniques: Student and Teacher Centred Approaches. The Student Centred Approach is advocated as the best approach for ESD; teaching techniques refers to the general principles, pedagogy and management strategies used for classroom instruction. A useful teaching approach engages students in the learning process and helps them develop critical skills. (Hoffmann and Bharucha, 2013).

The student-centred approach puts the student, rather than the teacher, at the centre and engages students with their learning, for example, through discovery-led, project-based, student-led discussions, experimental and field trip methods (Hamilton-Ekeke, 2007). Kopnina, (2012), argued that emphasis on ESD has shifted from teacher-centred to learner-centred approach and this advocates active and inductive approaches to teaching and learning to enhance student engagement. Research carried out by Thanh, Gillies and Renshaw, (2008) demonstrated that student-centred teaching had improved the performance of students in Vietnam. Similarly, another research carried out by Hamilton-Ekeke (2007), in Niger Delta region of Nigeria also showed that student-centred approach to teaching and learning was more productive

than the teacher-centred method. Some educationalists, equally argued that student-centred approach be essential in achieving the goals of education for sustainability (Lotz-Sisitka, 2010), (Moore, 2005), (Robinson and Shallcross, 1998). Hoffmann and Bharucha, (2013), was of the view that learning through discoveries as well as by putting lessons into practice in the real world assisted students to work out how to think about complex problems and to feel competent in what they were doing. Students require knowledge about facts, but then they need the ability to act on that knowledge in the real-world; so that they can feel inspired and confident to face the challenges of sustainability, rather than becoming despondent by it.

On the other hand, a teacher-centred approach is when teachers are seen as experts who disseminate knowledge into the minds of the students. Here the teacher explains what they want the students to know strictly, in the classroom. This method does not encourage active participation by the students, but instead, it may hinder them from developing the necessary competence needed to living a sustainable lifestyle. At this Anthropocene era, Bharucha and Siege (2013), maintained that the education sector plays a critical role in teaching relevant skills to avert it. Teaching and learning should integrate sustainable lifestyles. Students need a basic understanding of the history and causes of actions that lead to recent crisis, knowledge and ability to distinguish between certainties, uncertainties, risks and consequences of environmental degradation, disasters and climate change, knowledge of mitigation and adaptation practices, that can contribute to building resilience and sustainability (Anderson, 2013).

Although some scholars argue that education is the problem in working towards sustainable future because it spreads a culture of denial that rejects the link between modernity and the problems that threaten the ecosystem. In this regard, Shallcross and Robinson (2007) were of the view that, if education is to help address sustainability it has to be transformed. In summary, therefore, student-centred learning engages students in challenging existing worldviews, beliefs, feelings and values through their active participation which leads them to self-reflection, self- directed inquiry, learning-by-doing and learning collaboratively within communities. These perceptions enable the objectives of ESD to be achieved, as well as helping the students to make decisions and carry out their actions to improve their quality of life.

2.2.5 Barriers and Solutions to Embedding ESD

Despite advocating the values of ESD, some scholars have observed that significant challenges still face systematic implementation of ESD, in the formal education sector, (Hargreaves, 2008), (Dawe, Jucker and Martin, 2005), (Henderson and Tilbury, 2004). One challenge is the reluctance of teachers to accept the ideals of ESD for inclusion in the already crowded curriculum. According to Henderson and Tibury (2004), most teachers perceived ESD as an "add-on" subject rather than a holistic change, in learning practices and pedagogy and due to time and resource constraints, do not want ESD to be incorporated into the existing curriculum. Studies have also shown that perceived irrelevance by the teachers affects incorporation of ESD into school teaching. In addition, Christie, Miller, Cooke, and White, (2013), had equally shown in her research in Australia, teachers do not see the link between ESD and pedagogical innovation. Another study by Borg, Gericke, Hoglund and Bergman, (2012) shows that limited awareness and expertise by teachers hinders the implementation of ESD. The teachers tend to feel that teaching sustainability is being imposed on them and cannot connect sustainability to their disciplines. The study revealed lack of knowledge and competencies were the two formidable challenges militating against integrating sustainability issues in their subjects. There are also issues of misconception about the term, knowledge, background, personal values and beliefs. The study of Leal Filho (2000) and Borg et al., (2012), had confirmed lack of understanding and knowledge of sustainability as one of the main barriers faced by teachers in implementing ESD. There is also the issue of leadership within schools and the larger administrative communities. According to Hargreaves (2008), most school administrators developed sustainability within their schools due to a personal passion for it. In his work, Ferreira and Tilbury (2012), revealed that school culture is another factor that is affecting implementation of ESD because people find 'change' difficult. Studies have also shown that inappropriate curriculum and pedagogy improvement in teacher training, the lack of an optimistic vision, conviction and individual teacher's efforts, constitute significant challenges to the adoption of ESD in a number of schools (Kopnina and Meijers, 2014), (Hargreaves, 2008), (Henderson and Tilbury, 2004).

According to Sterling (2010) and Moore (2005), mitigating the challenges that have been identified, school administrators and the government should synergise and find a way of integrating ESD into the existing curriculum, rather than designing a new subject for it. The government should also try to leverage on the energy, commitment and goodwill of the administrators who support sustainability and establish a governance structure to encourage systematic implementation of ESD to ensure the longevity and sustainability of ESD. Finally, in order to effectively facilitate the ESD implementation, the facilitators in ESD process and the educators should be encouraged to undertake professional development and training programmes in ESD as the necessary strategies to enable them have the time, opportunities needed to gain understanding and knowledge of sustainability and to gain the appropriate skills to teach sustainability. (Kopnina and Meijers, 2014), (Hargreaves, 2008), (Henderson and Tilbury, 2004). These suggested ways of mitigating ESD challenges as highlighted by Kopnina and Meijers (2014), Sterling (2010), Hargreaves (2008), and Moore (2005) could be achieved through Whole School Approach to sustainability.

2.3. Summary

Conclusively, there is extensive study identifying the Anthropocene Age on the planet and the need to re-orient our actions to avert causing more problems. Hence, many authors have stressed the values of promoting sustainable development and ESD for humans and the future world.

In order to have a clearer understanding of the issues involved in this study, the contextual and conceptual information about sustainable development and ESD were discussed. The chapter also reviewed and discussed the role(s) of education in achieving the expected 2030 SDGs. Also discussed were the teaching techniques or approaches with a particular focus on student-centred approach, which seems to be the most congruent with the objectives of ESD and sustainable development goals. The review of the literature suggests that for the human ability to contribute to a more sustainable future it will require the combined efforts of all.

It is however noted from the review of relevant literature that there is still a gap in the literature, identifying the status of ESD in Nigeria schools (Rivers State to be precise)

Thus, this study seeks to generate and provide empirical evidence to close the identified gap.

Chapter Three – Whole School Approach (Theoretical Framework)

> *"Coming here today, I have no hidden agenda. I am fighting for my future. At school you teach us to behave in the world. You teach us not to fight with others, to work things out, to respect others, to clean up our mess, not to hurt other creatures, to share and not be greedy. Then why do you go out and do those things you teach us not to do?"*
>
> *Severn Cullis-Suzuki, age 12, addressing the Rio Earth Summit, 1992, cited in Shallcross, Loubser, Le Roux, O'Donoghue, and Lupele, (2006, p.29)*

3.0 Introduction

In the previous chapter, the concept of Education for Sustainable Development (ESD) was extensively discussed as one of the means recognised by the international community in resolving the present global challenges facing the planet, through creating awareness of the challenges in the society. There was a move by the United Nations (UN) through UNESCO to re-orientate the school curriculum and pedagogy to address these challenges. Also discussed in Chapter One, was the different models of implementing ESD in schools, to get the desired result. This chapter reviews the literature relevant to one of the models of ESD, the Whole-School Approach (WSA). WSA is one of the ESD strategies, employed to ensure sustainability is, maintained as well as attaining the fourth Sustainable Development Goals (SDGs). The concept of a WSA to sustainability, as the name implies, means involving all aspects of the school working, towards sustainable development. This concept is employed as a guiding framework for this study, which calls for the entire school including students, teachers, administrators and support staff, parents and the community, being actively involved in working towards a sustainable society. This chapter begins with the explanation of WSA, and the five strands of the WSA developed by Shallcross et al., (2006), which are extensively discussed.

The importance of WSA as an ESD model is discussed with relevant case-studies where the framework, has been employed and the benefits of this framework are, also highlighted. Finally, the relationship between WSA and sustainable development is discussed.

3.1 Whole School Approach to Sustainability

The whole school approach to sustainability framework was founded on the imperative that, a whole-system approach has to be applied to achieve sustainable development, (Hargreaves, 2008). This implies that, sustainability cannot be achieved in isolation but that it requires, individuals from across the school and community to work together as shown in Fig 3.1 below. The framework addresses three critical components of school structure: Organisational culture, physical place and educational program. These three components comprise of school governance, pedagogical approaches, curriculum, resource management, school operations and grounds (Mathar, 2013). WSA advocates the need for the formal sector curriculum to be integrated holistically in all aspects of the school to support the notion that, ESD is an education for sustainable development. Which means that education is used as a tool to transform the community to achieve sustainability and not just a theoretical discussion to create awareness.

WSA supports active and participatory learning. According to Shallcross and Loubser (2010), active and participatory learning encompasses empowering students to assume responsibility for creating and enjoying a sustainable future. Such a vision for school education according to Pepper (2014), is transformative because when students leave school, they should have an understanding and concern for stewardship of the natural environment as well as the knowledge to contribute ecologically and economically to sustainable development. Which means that students need to understand the complexity of the world in which they live in and to have the knowledge, critical skills, values and capacity to participate in decision making.

Over the years, WSA has been adopted by some governments, interested in translating ESD policy and objectives into practice, refer to 3.4. Fundamentally, Mathar (2013) a member of ESD-Expert.net believes that WSA pulls everyone involved in schools together, to identify issues globally and locally, set priorities, plan solutions and put them into action. ESD-Expert.net is a group of four countries, Germany, India, Mexico and South Africa which share the same vision and conventional approach to ESD. They are academies, training of trainers, holding conferences and monitoring programmes on ESD. The strength and support of their training course are WSA. WSA

helps to examine, monitor and evaluate the conditions of the school how and offer good quality teaching and learning. This involves schools practising what they teach with the purpose to ensure that the values they profess are as much as possible explicit in their actions. It links formal education with informal education and non-formal education which suggests an efficient way of integrating all aspects of education because it connects the teaching in the classrooms with what transpires in other aspects of school and community life that influences learning. Which satisfies the objective of ESD by equipping people with the knowledge and skills they need to live sustainably. Mader, Scott, and Abdul Razak, (2013), had suggested a way forward: insisting that, schools have to identify areas to focus on in their curriculum and extracurricular activities and also ensure that the desired changes are effectively and sustainably implemented through 'whole - school' focus. Mathar (2013), equally supported this approach and also pointed out that this should reflect sustainability across the entire school; its academic programme, school policies and daily practices. In that way, ESD would not be seen as an 'add-on' subject but rather as an integrated subject that spans across all aspects of the school.

The WSA concept also encourages active participation from students and teachers as demonstrated in Shallcross et al., (2006), case studies of Sustainability in European Primary Schools (SEEPS) project and Forestier and Mejias (2009) case studies of British schools and Hong Kong schools. In the case of the SEEPS project, a primary school in London (Smallwood Primary School), was involved in raising funds to support a school (Somaliland Comprise of Refugees). This project aimed at enhancing the pupils in Smallwood Primary School's awareness of a culture other than their own. The project was intended to teach the pupils how to be active citizens practically. The Forestier and Mejias' (2009) case studies, which ran for over three years, between UK and Hong Kong schools, were aimed at empowering young people, in both countries to take responsibility in school and give them a voice in how school administration is implemented. They all proved to be valuable platforms as the results indicated that active participation had roles in developing students social and emotional skills and most significantly in building students' engagement with their learning which could lead to higher attainment. Furthermore, WSA encourages students' active participation, it is also an effective means of self-evaluation, since the students are the ones experiencing the teaching and learning. This would probably help to change their

perception, orientation and understanding of the environment as well as social justice about the claim of Holden, Linnerud and, Banister (2017). In learning to become active global citizens (one of the objectives of ESD) through WSA, school children are encouraged to be active rather than passive students in schools. This goes in line with the views of Robertson (2014) that, learning by experience, helps students work out how to think about complex problems and to exhibit competency in what they are doing.

Arguably, WSA is being advocated as a more promising way to develop action-focused ESD, because concerns expressed on the curricula whenever possible are reflected in day-to-day practice in a school (Shallcross, 2005). This could also help traits, characters and attitudes noticed in the classroom become positive behaviours, in the daily actions of not only the students but the teachers and non- academic staff. This model is relevant to this study because it systematically organises the students' interaction with the society in all spheres to enhance the sustainable standard of life and education in all schools.

3.2. Five Strands of WSA

The five strands of WSA were developed by Tony Shallcross in 2003, during his doctoral studies. The hallmark of the five strands is to ensure that the process employed involving the whole school, in practising sustainable development, is monitored and evaluated for efficiency of the model. Shallcross is now a visiting professor at universities in Canada, Greece, Malta, Slovenia, Sweden and South Africa and a consultant for UNESCO and Council of Europe. He has authored over 80 publications relating to ESD, whole school approaches, action learning, and communities of practice. He has built for himself, an international reputation in the field of education, especially in ESD.

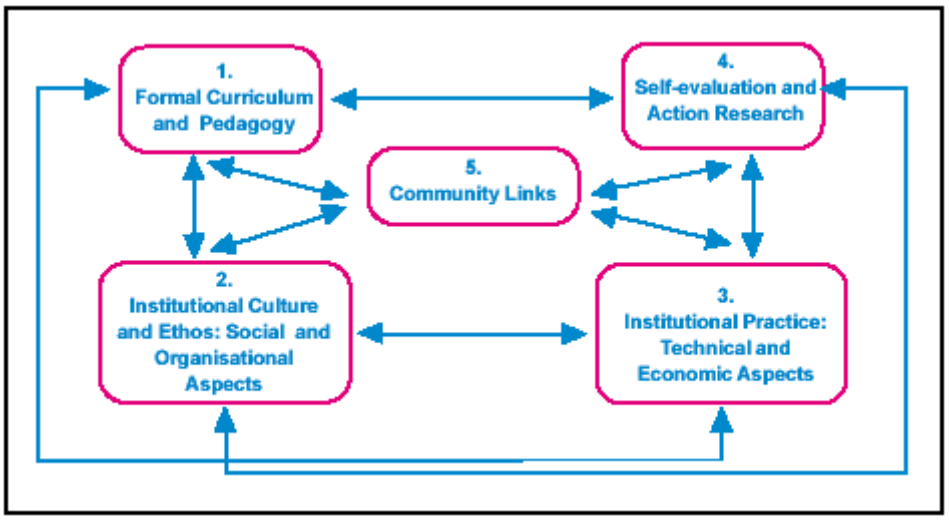

Figure 3.1: Whole School Approach

(Adapted from Shallcross et al., 2006)

3.2.1. Formal Curriculum and Pedagogy

This strand addresses re-designing the curriculum to support the values of sustainability and ensures that, the pedagogy drives this home. Curriculum and pedagogy are essentials in effectively addressing contemporary global issues. This is reflected in, Murwendo, Tshuma, Chinyani and, Moyo, (2010) survey of addressing environmental issues, through the curriculum which revealed how education has impacted on students' positive attitudes towards the environment.

As discussed above, ESD cuts across all subjects, therefore, it is essential that when developing school curriculum, elements of sustainable development are considered in all subjects. Developing the curriculum based on community needs is necessary because according to Shallcross and Robinson, (2007), sustainable development problems and solutions differ from one community to another. Therefore, it is essential that the curriculum should be able to empower students within their community by giving them authority, self-actualisation or inspiring them, with necessary skills to support themselves, their schools and their local communities in becoming more sustainable. For instance, River State in Nigeria is a highly industrialised place with many buildings, few green areas and indigent drainage systems, which means, flooding occurs in most parts of the state (Adedeji, Odufuwa and, Adebayo, 2012). Applying the WSA to this case or scenario, the curriculum here should reflect the

dangers of carbon dioxide to the environment as well as the importance of planting trees and legume crops to help hold the loose soil and also managing their waste. Learning experiences of students according to McMillin and Dyball (2009) is influenced by more than what is taught in the classroom; therefore, good pedagogical practice involves demonstrating to the students the relationship between theory and practice. In this way, they could recognise the connections of their studies to their community and the broader world which is particularly important in achieving sustainability. This strand in my view ranks the most important of the strands because, if the teachers are unable to connect or relate the curriculum to practical activities then the other strands would not be able to make meaning to the students. It is the effective connection between theory and practise that would bring about what the school practices which would eventually become the school's culture.

3.2.2. Institutional Culture and Ethos: Social and Organisational Aspects

School culture and ethos are the values, beliefs and norms of individuals in a group. According to Fidler (1997), culture is a distinctive way in which members of a school go about their work and relate to each other. This means that the culture of a school inevitably impacts on the learning of the students. Therefore, a school with an excellent developmental plan that has ESD embedded in it is seen as a possible way of ensuring that students cultivate the act of proper maintenance. Students from schools with high recycling and energy saving policies will most likely carry on with these attitudes throughout life. This strand would probably help to eradicate poor maintenance culture in Nigeria. Bolaji and Adejuyigbe (2012), indicated that maintenance culture is one of the critical factors affecting sustainable development in Nigeria, as Nigerians are yet to cultivate a culture of maintenance.

3.2.3. Institutional Practice: Technical and Economic Aspects

School practices concentrate on the practice of knowledge acquired in the classroom. According to Shallcross, Robinson, Pace and, Tamoutseli, (2007), involving students in decision making about purchasing and resource management as an important learning opportunity has the potential to make their school and home more sustainable

environmentally, socially and economically. This would also help to change students' perceptions that they are not capable of taking up responsibility. Schools use a wide range of resources for example food, water, energy, papers and cleaning materials. These are all provided by the earth's resources; therefore, the schools need to work towards using their resources within the environmental limits of the planet.

Measures or technologies which support ESD in schools should be made known to students. For example, planting of trees or using rainwater as the source of water in the school. The students need to understand and appreciate their function and purpose, to practising whichever policy that is put in place by the school in attaining sustainable development (Mathar, 2013). As envisaged by Shallcross et al., (2006) active participation of the students in sustainability activities will assist in building active global citizenship which is the core of ESD. Students need to see and understand that they can practice what is being taught in any possible way they could and this will help them develop a culture. The importance of this strand is that it brings the classroom activities into the limelight and in the long run, helps the students cultivate values that can form a culture/ethos for the school.

Whatever has been taught in class as a measure of preserving earth resources, should reflect in the school's day to day routine activities. This means that the school puts into practice what has been taught. Hence, the students are more convinced of the knowledge acquired. This strand also is linked to the other strands. It is linked to the school culture by the constant practice of particular knowledge of overtime, which becomes the culture of the school and this can rub off on the community, either through the students relating the knowledge to their parents or the school engaging in community development projects. Then the evaluation aspect is linked to this strand by checking the effectiveness of the measures put in place.

3.2.4. Self-Evaluation and Action Research

Monitoring and evaluating is a period of reflection. It enables schools to evaluate the effectiveness of their activities toward ESD. Shallcross et al., (2006), reported on how monitoring and evaluation enhanced school administration, parents and students of Smallwood school to deliberate on the Somaliland project. Monitoring and evaluation

help schools to set aside time before, during and after their activities to ask themselves what went well, what did not go so well and what to do differently next time. This offers a defined approach to acquiring good practice so that, schools can continuously build on their successes (Shallcross et al., 2007). The application of effective evaluation scheme is reported to be one of the challenges of implementing WSA. The DESD 2012 report emphasised the need for continuous monitoring, evaluation, research and flexibility. The report further indicated specific criteria to adhere to during the evaluation and monitoring. Such criteria as using indicators of participation, self-evaluation, own initiative, creativity, more outcome-based schemes and the use of a checklist to determine whether a particular school has taken specific measures, such as reducing carbon footprint and integrating sustainability topics in the curriculum (UNESCO, 2012).

3.2.5. Community Links

The fifth strand of WSA encourages a productive relationship with parents, carers and the community. Community relationship is an integral part of building a vibrant school culture because students, school staff and parents are partners in ESD, as asserted by Shallcross et al., (2006). As explained earlier, everyone has something to contribute. For example, research carried out in Zimbabwe, revealed how education effectively created awareness among local community on environmental issues, impact and reduction. Another example where community link has been used is, in the case of Smallwood and Somaliland schools (Shallcross et al., 2007). These are instances of supportive, collaborative, linkages and relationships that exist between the schools, students and community. Though not principally designed as an ESD project, it has features of ESD because it shows an international community link, which can help to motivate the entire school development. In addition, Shallcross et al., (2007) explained how this project enhanced students' awareness of cultures other than their own, helping them to develop a sense of social justice and respect which is a crucial feature of sustainability.

Schools operate within and become part of their immediate communities; therefore, a school and its immediate community, need an active working relationship to offer real-life opportunities for ESD. As a result of this students, schools and their local

communities, need to work in partnership in identifying and addressing local issues, and to proactively develop sustainable community measures which will provide opportunities for students to identify and address relevant community issues. Shallcross et al., (2007), argued that the opinion above is fundamental in preparing school children for a lifetime of active civic engagement because it is experiential learning with the students actively relating their learning to their everyday experiences

The five strands of the WSA present an opportunity for the education sector to improve the environmental performance of schools, raise the quality of education and foster a more sustainable future by imparting the values that the present day students might need to develop and maintain more sustainable societies. WSA calls for a commitment to 'change', from all stakeholders (i.e., students, teachers, parents and community). This would probably ensure that ESD goes beyond the realm of a pilot project to a more system-wide catalyst for change. This would probably encourage locally sustainable solutions to economic, ecological and social problems to be embedded into the curriculum content. The SDGs is covertly embedded in the five strands of WSA because the strands collectively address the three pillars of sustainable development on which the SDGs was developed.

3.3. Importance of WSA

WSA framework encourages students to recognise the relationship between their schools, classroom studies and the larger world. As discussed earlier, the good pedagogical practice involves demonstrating to students, the connections, linkages and relationships between theory and practice. According to Henderson and Tilbury (2004), the learning experience of students is influenced by more than what is taught in the classroom. The WSA framework thus encourages the teachers to educate the students not only through the explicit curriculum of the classroom but hidden curriculum representing the school's principles in administration and management of school operation (Rowe and Stewart, 2009). The majority of the schools that, have been working on this agenda, have been integrating sustainability into their school, through developmental and innovative practices. Examples of these practices include Gardening and outdoor extracurricular activities which tends to promote more ecological pedagogies; partnering and learning from countries around the globe; and

involving students in understanding their energy use, food production and waste management (Shallcross and Loubser, 2010). These practices symbolise the beginning of the journey which involves parents and other community members to disseminate information and develop their understanding of sustainability.

3.4. WSA Case-Studies

An example of a successful pilot project is the Australian Sustainable Schools Initiative (AuSSI), which is a partnership between the Australian Government, States and Territories that aim to support schools and their communities in becoming sustainable through a whole-system and a whole-school approach (Ferreira, Ryan and, Tilbury, 2006). AuSSI promotes the active engagement of stakeholders in programme development and management by including students, teachers, administrators, and communities. AuSSI started as a pilot initiative in 2001, and in 2006, received government endorsement to expand and consolidate beyond the pilot stage, in several States and Territories. Over 2,000 schools participated in the initiative, according to Ferreira et al., (2006), and AuSSI operated in every state and territory with the support of a designated coordinator.

Finland provides an example of a country in which the whole-school approach, is more systematically implemented in the formal education system, than most other Organisation for Economic Co-operation and Development (OECD) nations. Seven cross-cutting themes run across all formal subjects in the Finnish school curriculum at primary and secondary levels. These themes include development education, cultural identity, internationalism, responsibility for nature and sustainable development (Finnish National Commission on Sustainable Development FNCSD, 2008). These themes help to define the operational culture of schools and include cultural identity, participatory citizenship, responsibility for the environment, sustainable development and media skills.

A primary school in England, Smallwood primary school supported the developmental project, in Somaliland by raising resources to build a school in Somaliland. Though this has gone beyond Smallwood immediate community, it illustrated a supportive, collaborative grassroots culture and indicated an international community link. The project became a cross-curricular, extra-curricular and community-based project,

linking different ethnic groups throughout the UK. This initiative was chaired by the head teacher of Smallwood primary school. The project made the school children develop measures of how they could manage and sustain small-scale community developmental projects from start to finish. It also affected their parents because they accompanied the pupils on visits to Somaliland (Shallcross et al., 2006).

In Malta, 40 pupils and two teachers formed a Green Club at St Theresa's Secondary School. The club, aimed at promoting a pro-environmental agenda that demonstrates sustainable actions that helped to protect Malta's threatened natural heritage; the club encouraged active participation as every member's idea ware given due attention, (Shallcross et al., 2006). The ideas were initiated from within, and the level of success recorded was achieved by evolution rather than revolution because there was significant proof of changes evident in the lifestyles of the school community.

In South Africa, teachers from Foundation for Environmental Education (FEE), Eco-school reported that their involvement in a whole school program had helped them to reflect on their practice and also took actions to improve on it (Conde-Aller, 2004). Some schools are fundamentally restructuring how they make decisions about curriculum development, management and operations by engaging in partnerships with the whole school community including governing boards, school management, teachers, caretakers, parents, and students alike. Evidence emerging from these experiences suggested that participating schools were more likely to demonstrate leadership and models of good practice than non-participating schools (Henderson & Tilbury, 2004).

In conclusion, these case studies indicated that WSA framework is not a rigid framework; therefore, it could fit into any community or context. They illustrated characteristics of procedures and principles of democratic schools including Equality, freedom, tolerance, consideration of other people's interests and respect for other people. There was evidence of a sense of citizenship by allowing them to contribute their ideas to the development of their school's indoor and outdoor activities. The case studies also implemented the theory in practice thereby empowering the students, by equipping them with skills they need to assist not only the schools but also their communities to become more sustainable. Finally, parents' involvement in the process enhanced and resulted in their positive perception about the entire process. These

also show that young people can and do have a lot to contribute to the improvement of their learning environments which could be extended to the broader community.

3.5. Benefits of WSA

Shallcross and Loubser (2010 highlighted that students become more engaged with their learning in a school, where WSA framework is practised. These activities promote interdisciplinary knowledge, encourages logical reasoning and improve students' ability to instantly put knowledge into action, rather than accumulating skills for use later in life. It also encourages the development of knowledge of local issues, which provides a context for learning and a framework for the evaluation of local, state and national issues.

WSA framework thus, assists in developing leadership skills in students, especially self-leadership, decision making, taking responsibility, being respectful, being appreciative of how school systems operates. Accordingly, Murwendo et al., (2010), stated that such practical experience with sustainability, help students develop problem-solving and critical-thinking skills. This empowers students, to become 'agents of change'. Students' engagement in relating classroom knowledge, to school, however, encourages financial investment through energy supply efficiency, adequate water supply, reduced waste generation and greening of the school environment. These practices also give more opportunity to students and staff to work together. It encourages, more of cultural interaction between different ethnic groups in the school. Finally, WSA encourages partnership and collaboration, through the development and management of sustainability projects for the benefit of all involved.

3.6. The Limitations of WSA

The likely challenges of this framework include the time demands and constraints, organisational hierarchies and sociocultural environment. WSA framework requires time to develop naturally as well as opportunities for consistent participation. This framework demands time on the participants to engage in informal processes with other group members as observed in the case studies discussed earlier. Another

possible challenge could be socio-cultural demands and environmental threats arising from where a particular school is located.

3.7. The relationship between WSA and Sustainable Development

In 2009, UNESCO held a world conference in Bonn, Germany. The conference addressed the importance of ESD as an integral component of quality education in the twenty-first century (UNESCO, 2015). ESD gives everyone the opportunity to acquire the values, competencies, skills and knowledge necessary to shape the future in line with sustainable development. This is because ESD integrates content related to sustainable development into education using teaching and learning methods (UNESCO, 2015). WSA is to help put theory into practice because the essence of the framework is to ensure that what is taught in the classroom as much as possible is put into practice. Technological solutions, political regulation or financial instruments, may not help achieve sustainable development, instead, it requires a fundamental change of mind-set that will yield changes of action by moving sustainable development policies into action to meet different global, regional, national and local needs.

According to McKeown (2002), a country with a high number of educated citizenry could enhance a national sustainability plan. Stressing further, countries with high illiteracy rates and unskilled workforce have fewer development options, and this could make those countries poor because they depend on other developed countries for the supply of manufactured goods.

3.8 Conclusion

In summary, whole school approach enables schools to function in different dimensions across the school in a coordinated and articulated manner. Included in the curriculum are extra-curricular activities like engaging the broader community as well as teachers' training programs. This holistic initiative would probably help students build values, attitudes, knowledge, skills and confidence needed to develop practices and take decisions which are compatible with a sustainable and equitable society hence, increasing the benefits for them as individuals and learners. It also, empowers students to be active, informed and responsible citizens who are aware of their basic

human rights and would be committed to the practice of participative democracy. The fact that this framework and approach support curriculum development, students' motivation and staff development may not be overemphasised.

Chapter Four – Methodology

4.0 Introduction

This chapter explains and justifies the research design and methodology employed to investigate the implementation of Education for Sustainable Development (ESD) in junior secondary schools in Rivers State of Nigeria. The chapter begins with a discussion about the pilot study carried out before the main study and then an explanation to support my philosophical stand, which informed the methodological approach and methods employed. A qualitative approach based on interpretative paradigm explains the ontological and epistemological positions of this study. In summary, the research design has areas of focus: the content analysis of the state syllabus for basic science, basic technology, cultural and creative art and religion and national values for evidence of ESD; and a case study of two rural and two urban junior secondary schools in Rivers State. The methods of data collection for the case study were through observations within the schools, of three student focus groups in each school and interviews with four subject teachers and some administrative staff in each school, and interviews with the principal and vice-principal of each school. Also, the Assistant Director, Nigerian Educational Research and Development Council (NERDC), Southeast branch was interviewed. Finally, the chapter highlights the importance of research ethics for reliability and validity to derive meaningful results.

4.1 The Pilot Study

A pilot study with participants, who had close and recent contacts with the Nigerian educational system was carried out in March 2015. The participants for the pilot study were carefully and deliberately selected, which were made up of three Nigerian research students with teaching experience in higher institutions and seven Nigerian undergraduates who had completed their secondary education in Nigeria (in public and private schools) less than three years before gaining admission to the university. Two methods were adopted in collecting data for the pilot study phase: focus group discussion with the undergraduate students and semi-structured interviews with the research students. The focus group discussions began with a pictorial presentation of different types of environments in Nigeria. Pictures of clean and green areas and

those of dirty streets littered with waste materials were equally shown. The pictures stimulated a discussion about sustainability and education for sustainable development with elements of Whole School Approach (WSA) embedded in the discussion. The interview questions for the research students were based on the current literature of Sustainable Development, ESD and Nigerian education that I had reviewed at that point. From the focus group discussion, it became clear that some private schools in Nigeria had a framework in place that is similar to the principles of WSA and the private schools had better infrastructure than the public schools. The idea of the culture and ethos of the participants' schools regarding students' participation came from the focus group discussions. The interviews with the research students were helpful in understanding the students understanding of ESD, perceptions of global issues relating to Nigeria, and Nigerian educational system concerning school leadership and management as well as teachers' professional development.

The pilot study was helpful in acquiring the required skills in interviewing and facilitating focus groups in evaluating the appropriateness of these methods for the main study, as well as getting a snapshot of knowledge and understanding about ESD amongst Nigerians. All of this helped to improve the quality and efficiency of the study (Corbin, Strauss and, Strauss 2014). For example, this skill helped in constructing clear and concise interview questions without any ambiguities which were required for the pilot study phase. The process adopted and the feedback received from participants helped a great deal to identify if interview questions were open to a full range of responses and also assisted in avoiding leading questions, both of which are important to the credibility of the data collected. The duration of the discussions with the focus group was recorded, and they facilitated the planning for the main study. The pilot study equally provided the researcher with the insight into how to recruit and manage the participants for the main study, especially for the focus group discussion. The following issues were drawn from the pilot study:

- There is a vast discrepancy between the private and the public school sectors in Nigeria regarding administration, school leadership, teacher development and structure.

- Private schools in Nigeria practised or implemented some level of WSA. For example, private schools involved in community development by creating awareness of the importance of keeping the environment clean.
- Infrastructural facilities in private schools were better than the public schools.
- Even though there are sound policies put in place by the government, the policies were not well implemented. All research students agreed that the Nigerian education policy is not being implemented.
- The researcher observed poor welfare package for teachers regarding wages and in-service training.

The pilot study provided valuable insights into the main research study. For instance, it was quite confident that the sample size was realistic and workable while the effectiveness of the research design in gathering valuable data.

4.2 Philosophical Research Paradigm

The research adopts the interpretivist view in the interpretation of the concept of sustainable development in this research, and this is because the interpretation could be made according to my informed perception (chapter 2 refers). Philosophical positions operate as guides to research practice; as a result, certain assumptions exist in the course of conducting a research project. A philosophical position is considered as an approach to viewing the world and making sense of it according to Crotty (1998). Fetterman (2010) identified philosophical paradigm or position to include knowledge and helps researchers comprehend how issues are managed. Somekh and Lewin (2011) concluded that the way a researcher views the world affects their selection of research methodology. These assumptions mostly relate to how one knows the world and what one does when conducting research. These assumptions also bring different views about the nature of reality (ontology) and ways of enquiring into the nature of reality (epistemology) as stipulated by Cohen, Manion and, Morrison, (2011). These assumptions differentiate what can be identified as vital knowledge to appraise the research methodology.

4.2.1 Ontology and Epistemology

Ontology is the nature of reality in a field of social entities. These social entities are grouped into two aspects; objectivism: which states that social entities exist as external facts beyond human influence and secondly subjectivism: which takes a stand that social actors are unceasingly adapting social phenomenon and their meanings. Subjectivism states that social phenomena are formed by opinion and ensuing actions of social actors (Cohen et al., 2011). The Objectivist view is that 'reality' is completely independent of human ways of knowing about it, and there is only one truth which can be accessed by the intelligent application of research. Objectivism requires an objective, pragmatic position towards data, which are normally quantitative. Objectivism is the ontological position that underpins most quantitative research. The positivist stand is that the researcher is independent or separate from the research and it is an index of what exists. Positivism seeks facts, and the purpose of social research following this paradigm is to develop abstract and general theories about how the world works by testing hypotheses (Bryman, 2012), (Cohen et al., 2011). Interpretivist, on the other hand, seeks explanation and understanding of constructed social realities by interpreting qualitative data (Bryman, 2012), (Cohen et al., 2011). The interpretivist accepts the inevitability that the researcher's interpretation of the world around them will play a role in constructing new knowledge from research.

Epistemology is concerned with what should be regarded as genuine 'knowledge' in a discipline. The fundamental issue is how we identify which knowledge to trust. A natural science epistemology assumes an open relationship between the world and what we perceive it to be. It often takes a deductive approach where the role of the research is to test theories. It takes an objective social science stand in data analysis to achieve a positivistic outcome. On the other hand, science epistemology often assumes that knowledge is subjective. It holds that research outcomes can reveal more than one 'truth' because the understanding of the world is about specific social and cultural contexts (Braun and Clarke, 2013; Bryman, 2012).

This research assumes an ontological position that reality does exist. This reality is subjective because it is assumed that reality is underpinned by values and attitudes of individuals concerning global challenges. Because there is no single truth to the way, sustainable development is conceived. Since religion determines an individual's

values and attitude, social context, family or education. It is a paradox that Rivers State is endowed with many natural resources, but an industrial State, which suffers poverty, pollution, flooding and other environmental issues. However, the wealth from the state contribute to the mainstay of the Nigerian economy, yet it is in a deplorable condition. The issues could be attributed to the values held by the inhabitants, their attitudes and perception and their level of education. In chapter one, there is an assumption that the people of Rivers State were literate and secondly, they believe that education changes attitudes and values of individuals. The researcher foresees varied opinions and as such one single truth may not exist in this situation. The research design accommodated this subjective position by selecting four schools as a case study to gain in-depth views of what the problem could be. It also informed the selection of methods employed in this research. Below is a pictorial summary of research design.

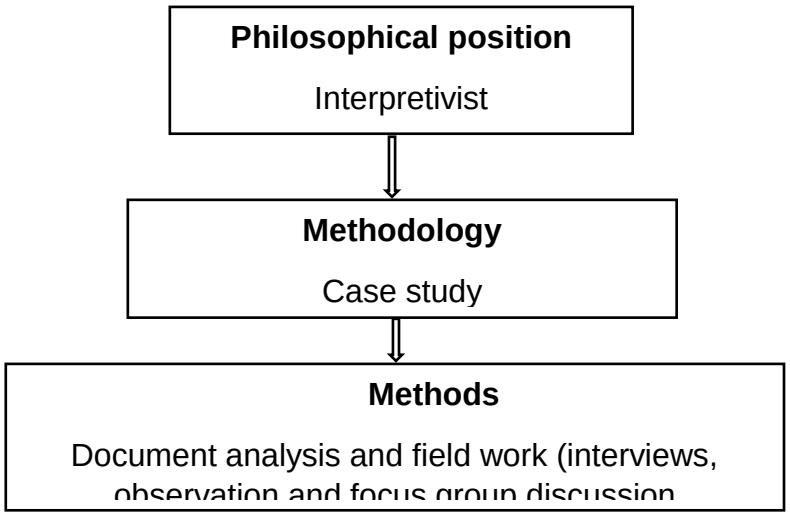

Figure 4.1: Research Design

4.3 Document Analysis

Included in the document analysis strand of the data collection are two types of documents. These are the junior secondary school curricula and the Nigerian Education Policy documents. According to Hitchcock and Hughes (1995), educational research requires a comprehensive documentary review and analysis to complement

other methods employed as well as give insight into developing interview questions. The purpose of using these documents is to identify areas where the goals of sustainability and the objectives of ESD are addressed in the junior secondary school curricula either overtly or covertly, with reference to insights from the literature review about attitudes, values and stewardship. This hitherto to confirming the policy guiding the educational system in Rivers State.

The junior secondary school curricula documents selected for the analysis covered all year groups in the subject areas of basic science, basic technology, cultural and creative art and religion and national values. These documents were the 2011/2012 edition. These four subjects were chosen because the subjects closely related to human nature, beliefs, livelihood and home management, environmental issues and technology, and so are most likely to reveal evidence of the goals of sustainability and objectives of ESD. For example, basic science and technology teach the knowledge and understanding of living things as well as physical processes, which are required in understanding relevant concerns surrounding global issues. With the knowledge of cultural and creative art, the students have the opportunity of knowing the history of their society and how civilisation has either positively or negatively affected their environment. Likewise, Religious and Social studies are crucial to the development of the values, attitudes and skills which are necessary for behavioural change required to achieve sustainable development. Values and attitudes are essential to the underlying philosophy of ESD. These subjects were employed in investigating, analysing and communicating valuable information.

The Nigerian Education policy document published in 2004, was analysed to gain insight into the policy guiding the governance of the schools including administrative management and teacher training. These documents (curricula and policy documents), were produced by the federal government of Nigeria and were sourced from the Nigeria Ministry of Education, hence confirming the authority, authenticity and credibility of the documents. These documents were prepared independently and long before the commencement of this research work, and therefore was, not produced for the benefits of this work.

Analysis of all these documents provided the necessary foundation for the fieldwork strand of the research design. The documents provided the insight into the

organisational structure of government schools and the policies guiding the recruitment and terms of service for the academic staff of the schools in Nigeria. Besides, it also gave the inhabitants the constitutional rights to education and their relationship to national policy and school enrolment. Furthermore, these documents were also used as triangulation during the interviews with the teachers, NERDC officials and the Head teachers in confirming the credibility of the content of the Nigerian education policy. A category list made from sustainable development and ESD literature was employed as an interpretive tool for analysing the secondary curricula and Nigerian Education Policy documents.

4.4 Methodology - Case Study

As discussed in section 4.2.1 this research employs qualitative means of data gathering of which its purpose is to provide an in-depth understanding of how quality education as one of the SDGs can be achieved through WSA framework. Therefore, this research employs purposeful sampling technique targeting a specific homogeneous group; government-owned junior secondary school. Government established schools were considered as the best case, to get a consistent rich data that would ascertain the awareness of education for sustainable development as well as the appropriateness of WSA model in Nigerian schools. The choice of the schools is because the curricula and education policy used in the schools are same. This study engaged four junior secondary schools in Rivers State, and their details are given in chapter five. It would be impossible without constraints to do an in-depth study of 7,129 junior secondary schools in Nigeria within the period of this research; therefore, a case study of four junior secondary schools in Rivers State was done to investigate the presence of ESD in Nigerian secondary education (Stake, 1995). Recall the discussions, in chapter one, Rivers State was most appropriate due to the high level of economic activities in the state, which has contributed to high environmental pollution and depletion of natural resources in the state. According to Eke, (2017), life expectancy in Rivers State is lower than other states in Nigeria due to oil spillage and gas flaring caused by the oil industries. Rivers State harbours both the downstream and upstream crude oil activities in Nigeria, which account for high environmental degradation. This environmental degradation has negatively affected both the

economic and social life of Rivers State indigenes who are predominantly farmers, and their farmlands and rivers have been severe, degraded by oil spillage (see Appendix 3.3). Out of 23 Local Government Areas (LGA) in Rivers State, four LGAs were purposefully chosen for this study. Two LGA in the urban area with high economic activities and two LGA in the rural area where oil industries are located. These four schools considered in this study were for comparative analysis, regarding provisions of infrastructure and facilities in the schools to investigate equity between rural and urban schools and the welfare of the pupils and staff because one of the underlying factors of sustainable development is social justice. The government established schools (also referred to as public schools) use the same curricula and education policy, which aid the adoption of the research design and also represented all essential elements in the research context. This situation is not exactly same as private schools; therefore, this study has enabled us to arrive at a better judgement across the schools selected. Another reason for choosing public schools is that students who generally attend the schools are from poor background and since the government fund the schools, the students pay little or no fees with regards to the implementation of the education policy in Nigeria and UN recommendation (Aluede, 2006). Giljum et al., (2009), emphasised that the majority of the environmental problems caused by depletion of natural resources due to the over-consumption by the underprivileged in the society because they have to use natural resources in satisfying their immediate needs without thinking of the future. Since the majority of the populace attend public schools, substantial and credible data were obtained for the study. Another reason for using this strategy is that this study did not seek frequencies of occurrences, rather quality and intensity of the situation under study, by separating the significant few from the insignificant many. According to Cohen et al., (2003), significance rather than frequency is the hallmark of case studies, giving an insight into the real dynamics of situations and people.

A case study approach to research focuses on one or two instances in detail rather than a broader field of research evidence. This approach studied phenomena as they are, without introducing any control and gives the opportunity to select methods according to the nature of the investigation. The approach also provided the opportunity to query the reasons for specific occurrences within the schools and compared observations. This assisted in ensuring the credibility of data. These make

the approach very useful to small-scale projects as the data gathering was concentrated in the accessible area(s).

Scholars describe case-study research in different ways, Stake (1995), Simons, (2009), Yin (2014) and Cohen et al., (2011) were of the view that case study research is the study of a particular, single case with a blurred line between the phenomenon and its context. Creswell (1994) argued that a case study is a single case of a bounded system, such as a class, a school or a community. This is the case in this research, where the phenomenon: which is about attaining sustainable development and the context: junior secondary schools in Rivers State, is defined in a bounded system.

4.5 Research Methods

4.5.1. Observation

Observation as a research method offered me the opportunity to gather primary data from different locations. (Cohen et al., 2007). This method was employed in this study in two ways; as triangulation to confirm the interviews and focus groups discussion data gathered. Also, in gaining insight into the school environment to enable the evaluation of the appropriateness of WSA in Nigerian school context; this is in terms of infrastructure, relationships among the students and the teachers. The Head of Rivers State education board introduced the researcher to the schools' Head teachers, after an extensive discussion. The schools were selected with the help of the officer-in-charge of the state education board, being an academic with a doctoral degree in education. The Head of the Education board suggested that the four schools identified and selected from the different local government areas of the state formed a good representation of data. This suggestion was taken, without compromising the aim of my research.

The researcher noted essential features of each school relevant to a sustainable schools' model ranging from the architectural design of the school to staff attitudes. A minimum of five visits was made to each of the four schools selected with over six hours of observation during each visit which started from the time of morning assembly to the time of dismissal. During the observations, the following points were noted:

- The physical environment
- The environment of school: The location, campus culture, buildings, daily schedules of teachers and students.
- The arrangement of teachers' offices: The furniture arrangement and general condition of the offices, wall and the teacher's desk display.
- The arrangement of the classroom: The arrangement of furniture and the general condition of the classrooms, for example, wall display and the students' seating arrangement.
- Students in the class: The numbers of boys and girls, and their participation during lesson time.
- Teaching planning: How does the teacher further understand the concept of sustainable development and the objectives of ESD? How does he/she find resources for the teaching? (Websites, books, journals, asking people)
- How does the teacher engage with the task? (With interest/lack of interest, face difficulties, joy and impatience)
- How does the lesson begin? What happens next? How does the lesson end? (all these detailed structures and sequences of the lessons and the time used for each section of the lessons were noted)

These points were observed to ensure effective ESD implementation, it involves the conducive environment, with useful teaching aids and qualified teachers that can translate curricula content effectively. The teaching aids would help to link learning to real-life experiences, and this will aim at promoting competencies like critical thinking, imagining future scenarios and making decisions in an individual to allow informed decision to be made.

4.5.1.1. Whole school observation

Playing the role of a non-participant observer it was necessary to observe the whole school environment to gain a full understanding of the environment in which the students spent most of their day and where the teaching took place. The facilities, the arrangements of the school activities, and the operations of school during classes, lunch times/ breaks, teachers and students' behaviours. Contextual information of the schools was collected during the observations. Also during the observations, the researcher had conversations with staff and students. These informal discussions were designed to be as natural as possible to establish rapport. The schools' observation took place according to plan without disruption, and this happened throughout the whole process of data gathering. A detailed account of the schools' observation is given in the next chapter.

4.5.1.2. Observation in classrooms

The purpose of carrying out observation in the classrooms was to get an insight into the pedagogical activities and students' response to them. As a non-participant observer, physical observations of in-class teachings, during lessons were significant in assessing the teaching activities (how the teacher translates the curricula content in teaching), the students' interactions and their immediate reaction to subjects taught. It also helped to acquaint with the events in the classrooms to make the relevance of the data collected from the focus groups with the pupils (Smith, 2015).

Observation as one of the research methods is positioned within the interpretivist paradigm that acknowledges the importance of context and construction of knowledge between the researcher and what is being researched. This happened in an unstructured manner to enable the understanding and interpretation of the cultural behaviours within the schools selected for the research. Given this, it is essential to avoid having a checklist of predetermined behaviours, knowing that culture and religion could influence people's attitudes. Instead, the knowledge gained from the literature reviewed and the curricula under investigation to observe specific features as mentioned above in the schools could portray the existence of sustainability and knowledge (Mulhall, 2003).

This method helped in gathering data about the way the participants interact and use space, which is essential in confirming data gathered from other methods employed in the study. This enabled confirmation of if people act according to their words, which is the main reason for introducing whole school approach to sustainable development in schools. Clearly, through this method, it was possible to ascertain if what the teachers, head teachers and students say they do and what they do in reality are coherent (Cohen et al., 2011). However, two important things to bear in mind are; what people perceive as what they do and what they do are valid in their own right. Therefore, the interviews conducted were a means of getting the reason behind their actions. Secondly, the data gathered during observation were subject to interpretation informed by good subject knowledge of the research topic and objectives (Matthews and Ross, 2010). Another reason for choosing this method was because of its advantage of capturing data in more natural circumstances. For instance, after surmounting the initial awkward stages of entering the school, most staff became having in a friendly way ascertained that their schools were being used only for research purposes and not to monitor their activities. Therefore, they became relaxed and went on with their normal daily activities. This atmosphere was necessary to determine their real attitude towards their duties. They were also too busy to maintain behaviour that is entirely different from usual (Mulhall, 2003). This provided an insight into how physical environment influences the interactions between the teachers and the students.

According to Mulhall (2003), some issues like the role of the researcher, informed consent/deception, access and field notes could cause controversy during observation. Given this, the creation of a good rapport with the teachers, students and administrative staff during the first visit to the schools where necessary in assisting in the creation of mutual trust. Between the researcher and the teachers and managers of the concerned schools such that one is not be seen as an intruder into their privacy. To guarantee further unrestricted access to the schools the researcher required the testimonials or the vouch of two key personnel in the educational sector of Rivers State of the value of the research to the state; who were convinced of the credibility of the research. The researcher was open to negotiating between a carte blanche and restricted access. The under the listed scheme were adhered to in taking the field notes:

• What the actual buildings and environment look like and how they were used.

• The behaviour of the people/students in and outside the classrooms.

• Their daily process of activities.

• A chronological diary of events.

Throughout data gathering, field notes detailing what happened during observations and interviews were recorded and kept. The field notes obtained during the field work also described the thoughts, feelings and responses to situations arising from and during the observations. The observations made and the notes taken during each session were in detail and made accessible to the head teachers on demand.

4.5.2. Focus group

With the assistance of the subject teachers, twelve focus groups were conducted. Seventy-two students participated in the focus group discussions while eighteen from each school with three groups of six students each. These groups comprising of boys and girls were randomly selected from the three years of junior secondary school with ages ranging between 11 and 14 years so that each year group was represented. Ryan, Scapens, and Theobald, (2014), advocated the need for focus groups to be heterogeneous because studies have shown that focus groups were more successful in generating valid data when comprised of members with different authorities, status, knowledge and interest. It also supports getting a variety of opinion. Therefore, each of the groups selected had randomly selected students from different years in the junior schools.

The focus group discussions provided the students with the opportunity and space to discuss what they had been taught in class about their everyday situation, in an atmosphere where they were allowed to agree or disagree with each other. This group discussion explores how the students think about and relate topics taught in class to things happening around them. It also gives the opportunity to view the range of opinions and ideas they have concerning sustainability and the inconsistencies and variations that exist among them regarding beliefs and their experiences and practices.

Research in the use of focus group discussions has grown significantly in recent time because it encourages self-disclosure among participants to generate qualitative data that can be analysed later on. This method also helps in eliciting opinions or obtaining some suggestions (wider dimension) about a topic, as in the case of sustainable development where different people have different opinions about the subject matter, and this experience came to the fore during the discussion with the students. Other reasons for using focus group discussion is that it offers an opportunity for the participants to evaluate each other's reasons for holding a particular view, which was very helpful in getting a variety of different views to the issues faced by Rivers State. This discussion helped to ascertain the students' perceptions, attitudes and opinions about their learning outcomes and how they can relate it to their everyday situation (Matthews and Ross, 2010). For instance, during a group discussion, a participant answered a question in a certain way but listened to others' answers, and it prompted the participant to modify a view held, and in some cases, there was an agreement to issues that were never thought of. Therefore, the focus group discussions gave an opportunity for the students to argue and challenge each other's opinions. Hence provided a better opportunity of getting a more genuine account of their opinions, since they are to think about and possibly review their idea. This method of data gathering offered the opportunity to study the way in which the students collectively make sense of a phenomenon and construct meaning around it.

The participants for the focus groups were selected with the help of their teachers since they are familiar with the students and therefore knew which students could make a useful contribution. In the urban schools, the discussions took place in the schools' computer lab or library. In the rural schools, the discussions took place in classrooms because they have neither computer lab nor library. The location of the discussions was familiar to students, and their teachers were not included. This helped the students to relax and felt more comfortable which was the reason why they were able to offer more honest and genuine responses received from them. The discussions lasted for about 50 minutes on the average.

A brief introduction to the research and the activities the students were to carry out were given before the exercises started. The introduction was to enable the students to express their knowledge in a pictorial form, the use of 'rich picture' was employed during the focus group discussion. This method effectively helped to explore the

students' views about their environment and how they make meaning of what was taught in class with their everyday situation in a helpful way and to get an insight into how they thought the issues could be addressed.

4.5.2.1. Rich Picture

A 'rich picture' method was used to complement the focus group discussion to enable the students to express themselves as fully as possible. Berg and Pooley (2013) recommended rich picture as a means of global communication that far exceeds the limitation of text and speech. This method was used to evoke emotions, abstract ideas and to find out more about apparent issues. Each focus group was requested to draw a picture of either their environment at home or school. They were provided with flip chart, pencils and colour pens and a leader appointed for each group. Most of the students were excited and engaged well with the drawing exercise. Only two across all the focus groups seemed reluctant to join in. See (appendix 1) for a sample of the picture produced during the exercise. After the drawing, a discussion with the students ensued. They gave the reason(s) for each component drawn in the picture, what they liked and disliked about their environment, their reasons for each option chosen, and how best they can improve on the things disliked better. This was, done to determine their critical skills of relating classroom work to their daily lives and it helped to evoke the deeper element of their consciousness more than words would do, it also allowed the students to narrate their daily experiences. There is no single best way of producing a rich picture as different styles could be employed under different circumstances. The most important thing is to ensure that the three most important components of a rich picture (structure, process, and concerns) were included. The choice of this method was to find out how students can relate classroom knowledge to their activities outside the classroom. This will help determine the extent to which ESD can contribute to national sustainable development. Based on this, the students were left alone to make a drawing of their environment without the presence of their teachers to ensure the validity of the data.

4.5.3 Interview

After the researcher's intentions were declared to the head teachers concerning the research work and how to go about data gathering, a formal introduction of the researcher to the teachers involved was done by the head teachers and appointments were fixed to interview them based on the convenience of time. The teachers were first interviewed followed by the head teachers. This became necessary for the validation of some of the responses to the questions earlier asked, with the head teachers, and it also applied to the focus groups. The interview started with general discussions about recent developments before the interview questions were administered. The questions were administered in different forms based on the initial discussions. For example, one of the participants just concluded a class with his students before the interview commenced. Therefore, discussions based on the class activities with the students kick-started the formal interview and commenced to ensure interviewee was relaxed (Matthews and Ross, 2010). Twenty-five interviews were conducted. These were four teachers from each school who taught the subjects selected for this study the head teachers and the vice-principals from each school and one NERDC official. Qualitative research interviews were employed to gain insight into how the teachers, head teachers and the stakeholders at NERDC understood or perceived education in general and their knowledge, attitude, perception and attributes on global challenges such as ecological problems, poverty, and environmental issues. The interviews were held at their offices and a semi-structured interview was employed to enable a two-way interaction that would help in gaining a better understanding of the participants' perceptions about education and if/how education would have a positive effect on the economic and social lives of the citizens (Kvale and Brinkmann, 2009).

The guidelines for constructing and conducting interviews as advised by Bryman (2012), were employed. The first thing is defining the research question, creating the interview guide to help to answer the research questions, recruiting participants as mentioned earlier and defining the best way to carry out the interviews. The interview questions were objectively framed to help answer the research question(s) and not to reflect the researcher's presuppositions. The questions were simple and straightforward to avoid the participants forgetting to give a detailed response to the

questions posed to them. This idea was a lesson learnt from the pilot study earlier carried out which avoided prompting answers to the questions asked, in situations where the researcher needed to understand the answers provided by the participants, the answers provided by them were repeated to them to seek clarification. Right from the start, to avoid interrupting the daily activities of the participants to preserve the anonymity of all the participants the duration of the interview was made clear to all the participants and the interview was carried out during the free period of the teachers. Considering the prevailing political situation in the state at the time of the fieldwork, it became necessary to develop a positive relationship with the interviewees rapidly and assured them that the researcher was not a spy-agent of government.

The questions were drawn from the literature that was reviewed on the sustainable development WSA document analysis of Nigerian education policy as well as the curricula of junior secondary school, (see appendix 2). According to Bryman (2012), the questions were constructed with the following in mind: common sense, knowledge, experience, brevity, relevance, unambiguousness, specificity and objectivity. These questions were pre-tested during the pilot study conducted in March 2015; however, the questions were modified, fit for the purpose. The content of the questions for the teachers was 80% similar, and the 20% difference was as a result of some responses from the list of questions which were earlier prepared and same equally applied to the head teachers. This decision was taken to allow for a degree of freedom and adaptability in eliciting the information from the interviewees. Also, the decision was taken to avoid restricting responses from the participants to the researcher's interview questions only bearing in mind that every piece of information counts.

The interviewees were identified and selected based on the subjects chosen for the study. Randomly, in-moment discussions with some members of non-academic staff took place as well during observation. A set of preliminary questions were administered to the 25 participants to establish their demographic information. The interviews lasted for 45 minutes on the average; to avoid encroaching into their work schedules and the whole process of the interview was, recorded with a digital recorder for storage (Denscombe, 2010).

The credibility and reproducibility of this approach were carefully considered at the design stage. Reproducibility is concerned with the interview producing the same

results. Also, credibility to determine the feasibility of producing same results with a similar sample, and responses to the questions would answer the research questions and meet the objectives of the research. The rationale behind choosing these participants was to ensure the credibility of the data collected because the participants were directly involved in the decision making as well as the implementation of the curricula and to ensure education policy was carried out. Using the semi-structured interview as a method to gather data for the study was seen as a real method because it allowed the incorporation of both the subjective and objective information as well as demonstrating subjective meanings of events and processes. The interviews provided me with a greater understanding of attitudes and feelings than quantitative data could have.

4.6 Data Analysis

The data gathered from the interviews and observations made were analysed using a thematic approach. Also, a semiotic visual analysis approach was used in analysing the rich pictures from the focus groups. The thematic approach helped in identifying, analysing and reporting patterns within data. Though the task of transcription is generally perceived to be time-consuming (Hycner, 1985) however, transcribing the raw data was found to be helpful because it helped in comparing one with the recorded data as well as generating initial insights for its subsequent classification. The raw data was transcribed verbatim to avoid misunderstandings and misinterpretation of the original information after which, the data was filtered (Cohen et al., 2011). Themes developed from the literature review, mainly from the five strands of WSA to the UN SDGs and ESD were used as a guide in analysing data gathered from field notes, interview transcripts and documents (curricula and education policy). In the first instance, a constant interplay between gathering and analysing of data was made. By this, it meant that data analysis started immediately after the first observation at the schools was made, and the results helped in shaping the interviews with head teachers, subject teachers, the assistant director of NERDC, Southeast region and focus group discussion with students.

At the conclusion of data collection, a software called ‘express scribe’ was employed to transcribe the interviews and focus group discussion. This software helped the

researcher to control the speed of the recorded data as transcription was going on. After the transcription, the procedure outlined by Bryman (2012; p575) was employed that enabled the raw data to be coded;

- Of what general category is this item of data an instance?
- What does this item of data represent?
- What is this item of data about?
- Of what topic is this item of data an instance?
- What question about a topic does this item of data suggest?
- What sort of answer to a question about a topic does this item of data imply?
- What is happening here?
- What are people doing?
- What do people say they are doing?
- What kind of event is going on?

With the above points in mind, the process first started with sorting, annotating and collating to gather the written data into manageable chunks. The collation was done in groups. The interview transcripts from the sixteen teachers were in a group, the head teachers and the NERDC official were in the same group, and finally, the transcript from the focus group discussions was collated in another group, to facilitate the proper management of the data. At the conclusion of the grouping, the transcripts were proofread, and all the comments of possible interest were highlighted using colour coding for further analysis. The reflective field notes were subjected to the same process.

The analysis was done in three stages: At first, the documents used for this study were analysed separately using the knowledge from literature written on the global goals and principles of sustainable development and the objectives of ESD. The junior secondary school curricula were thoroughly perused with the mind of confirming the appropriateness of the content of each topic/title and the learning outcomes in addressing significant issues challenging the developing countries in terms of achieving sustainable development. Also considered was, how well the learning

outcomes of these titles could help to develop the necessary competencies required for the future and the appropriateness of the teaching materials in delivering these titles to the students. Secondly, the transcribed data from the interviews and field notes from observation were coded following data familiarisation. The next step in the thematic analysis process was to combine and sort similar topics into sub-themes. A careful re-examination of the sub-themes and original data was done to avoid omission of data, after which the final form of the theme was constructed and illustrated with some quotations from the original text to help the readers to make informed decisions of the findings. Lastly, the semiotic visual analysis approach to analyse the rich picture produced during the focus group discussion was used. The pictures were interpreted based on the discussions done earlier with the students after they produced the rich pictures of their environment having the objectives of ESD and appropriateness of WSA in mind. The credibility of this approach is relative because the significance of images is not well understood as a one-way process from image to the individual but because of the complex inter-relationship between the individual, the image and other factors such as culture and society. If all the variables (education policy, curricula, and same participants) were the same, then this approach would be said to be credible. According to Jewitt and Oyama (2001), the semiotic visual analysis is a unique process of conveying meaning to images, and as such, it is a negotiation between the producer and the viewer, reflecting their individual social, cultural and political beliefs, values and attitudes.

This approach to analysing the data was advantageous because of its flexibility, and it is relatively easy and quick method to learn considering the constraints of time in the research process.

4.7 Ethical Considerations

Ethical considerations were taken into account throughout this study to respect the rights and dignity of research participants. Research Ethics has various aspects concerning the design of the research, in soliciting and dealing with participants and in analysing, reporting and storing data. To ensure the trustworthiness of this research, protect the participants and to ensure that the data needed for arriving at meaningful conclusion were generated, some ethical guidelines were put in place. The ethical

guideline was drawn from the following: Ethical guidelines from the Social Research Association's Ethical Guidelines (Ritchie, Lewis, Nicholls and, Ormstron, 2013), British Educational Research Association (Hammersley and Traianou, 2012). Also, used is the ethical standards on Academic Research involving human participants as set by the University of Huddersfield, in the research design, in the collection and storage of primary data, and in analysing the data to yield the expected results.

The gatekeepers of the school came in handy before the commencement of data gathering were part of those who facilitated the smooth take-off of this study. In addition, the Director of Rivers State Education Quality Assurance Agency, who is a professor in education, and the head of the State Education Board in Rivers State, assisted a great deal. The aims and practicalities of this research study were discussed extensively with the gatekeepers, and they were glad this study was being conducted at a time where the education system in Nigeria is facing daunting challenges. They had been part of similar research work about Nigerian education in the past; hence they appreciated the value of the study. The Head of the State Education Board personally introduced the researcher to the head teachers of the school selected for the study. At the time of data gathering, there was a transition in government from one political party to another, which was the reason why the Head of the State Education Board had to do this personally. This was to prevent the participants from misconstruing the whole idea and tagging the researcher as a 'government spy', which could have affected the credibility of the data. An extensive discussion on this was equally held with the head teachers before collecting primary data (Wiles, 2012). The participants were briefed on what the research and their involvement entailed (see appendix I and II), before commencing the interviews and their right to withdraw from the process if they no longer wished to participate in the research. For the students used in the focus group discussions, the head teachers consented; on whose behalf by law have the full authority to do so since the data gathering was taking place within the school premises. Though the informed consent form did not state how the data dissemination would be done, the participants were assured of data protection with the utmost discretion and were equally, assured that no specific individual would be implicated through the result of the study. The participants were assured of their anonymity using pseudonyms or a symbol to cite quotations and label the schools used for the fieldwork. The personal interviews took

place in each participant's office, to create a protective environment which would allow freedom of speech and sharing of open and honest views. They were informed in advance that the interviews would be audio recorded, though an option was given to the participants to opt out if they were uncomfortable being recorded. None of the participants objected to using the tape recorder. Unauthorised persons were not allowed access to the data gathered to ensure the confidentiality of the participants.

Measures suggested by some scholars (Krueger and Casey, 2000), (Greenbaum, 1998), were taken into account during the interview. Some of these measures are:

- The proceedings and content discussed were kept secret.
- Participant(s) were at liberty not to respond to any question they were not comfortable with to answer.
- Respondents were given the opportunity to reflect on what they felt rather than what they thought the researcher wanted to hear.
- I gave confidentiality priority attention. Participants were assured that the details of the recordings would be kept in a safe place which, only the researcher would make accessible. Additionally, only information on the analysis of the material was discussed in confidence with appropriate professionals in the researcher's field as well as the researcher's supervisor, purely for academic purposes (Bhana, 2007). The results that were obtained after the analysis was made available to the gatekeepers for documentation purposes.

Regarding risk and safety during the fieldwork, the risk assessment was done before embarking on the fieldwork. The teachers' perceived fear that they might lose their job was allayed by the information provided on the informed consent form that provided for confidentiality and anonymity of the participants (Wiles, 2013). Generally, this study was perceived to be a beneficial project to the State, since its purpose is to confirm the appropriateness of WSA framework in the State secondary education. The benefits derivable from the success of this project is believed to outweigh the minimal risk it poses. The only unanticipated risk was the political upheavals and social unrest that prevailed in the State that did not allow the second phase of the fieldwork to take place. This risk, however, was resolved through online communication to access needed.

Finally, throughout the research process, respect for intellectual property was observed by ensuring that proper acknowledgement for all the materials used for this research work was made. Personal data obtained and used was carefully stored according to the rule from BERA on Data Protection Act 1998.

4.8 Summary

This research is embedded within the philosophy underpinning interpretivism. By giving attention to ESD in this study, the relationship between the chosen pragmatic positions and the research topic were identified with an exploration of the influence of research questions. Case study as the preferred methodology was, influenced by the philosophical notions and its relevance to educational research. The fieldwork was conducted in four schools in Rivers State, and it lasted for six weeks to ascertain the state of ESD and the appropriateness of WSA in Rivers State context. A range of research methods for data gathering was employed, which included, document analysis, observation, interviews and focus group discussions. The chapter ended with an explanation of how the ethical issues faced during the research was, handled. The next chapter discusses the findings of the data gathered in the course of this research.

Chapter Five – Analysis and Findings

5.0 Introduction

In the previous chapter, the techniques employed during the primary data gathering were discussed. The primary data gathering involved a case study of four government owned schools in Rivers State, semi-structured interviews were conducted with 25 participants, focus group discussions were conducted with pupils from the schools, together with observations at the schools. This chapter explains how the data gathered were analysed and then presents the findings.

This chapter is divided into two principal sections: analysis and findings. The findings of this study are presented in two subsections: findings from the secondary data (National Policy on Education and four junior secondary school education curricular documents) and findings from the fieldwork done in Rivers State, Nigeria. The field work involved over 120 hours of observation, which lasted over a period 25 school days. As discussed in the methodology chapter, a case-study design was chosen in order to gain an in-depth understanding of the potential of the teaching of Education for Sustainable Development (ESD) in junior secondary schools in Rivers State contribution to the national sustainable development. As well as the appropriateness of Whole School Approach to sustainability (WSA) model in junior secondary school education. The data gathered in the course of carrying out this fieldwork is presented in the following order; i) findings from the documents used; ii) the observations carried out in the schools; iii) the demography of the adult participants (this information about age, sex and educational levels was taken in order to explore if there is a relationship between years of service to level of commitment and competency); and finally iv) using the five strands of WSA (Theoretical framework) to present the findings from interviews with teachers, head teachers and focus group discussion with the students.

5.1 Data analysis

This section explains how the data gathered during the research was interpreted to draw out the findings and make meaning of them. From an interpretative view point, the analysis of this study was done using a framework analysis otherwise known as thematic analysis. Forming themes from the raw data by examining the meaningful

and symbolic content of qualitative data in a deductive manner. The research question and the WSA framework were used to group the data from the field work. The following steps were taken to analyse the interview data systematically, the data gathered were transcribed from voice to texts using a software called express scribe, after which data cleaning took place; the responses were 'tidied up' into coherent English, but without altering the respondent's meaning.

The researcher studied the data by transcribing the audios and reading through the transcripts carefully. The next step was to do the initial coding which was developed from both a priori issues and from emerging issues. The second level of coding was done by identifying specific pieces of data which corresponded to different themes formed from literature review, then creating charts using headings from the themes before finally mapped and interpreted the data by searching for patterns, associations, concepts and explanations from the data.

The documents used for this study were analysed using themes from literature review on sustainable development concept and education for sustainable development. The curriculum was analysed by 'matching' it to an expected ESD curriculum, the objectives and what it is meant to achieve. The pictures the students drew during the focus group discussions were analysed using an interpretive analysis to examine what the students inferred or implied through their pictures. For the observation data, the information recorded in field journal during the fieldwork was described into what was observed chronologically overtime, pointing out key events in order of importance and describing necessary processes. Key points were matched to the already identified theme formed from the interview data.

The data analysis for the field work started with the field notes taken during the observations in the case-study schools. The field notes were re-written in details so as to be able to select key events and form themes. Next, the audio recordings of the interviews were listened to repeatedly and transcribed. The transcripts were read through thoroughly and several times in order to get acquitted with the data gathered. The next step was an initial coding of the data to identify and mark underlying ideas. The researcher applied themes drawn from the literature review as a guide during the process of data analysis, keeping in mind the purpose of the research. After the initial

coding, the emergent themes were grouped in categories and their relationships to each other mapped.

5.2 Document analysis

This section presents the findings from the content analysis of the documents used in this study. The documents analysed for this research are; The National Policy on Education (2014), which provides insights on the present state of policy guiding the education system in Nigeria; and the Junior Secondary School Curriculum (2009), which describes the subjects, content and the appropriate teaching aids for each topic. These documents help in presenting the findings of the first part of research question one, which is to confirm the potential for ESD taught in junior secondary schools to contribute to the national sustainable development. These documents were studied before and after embarking on the primary data gathering in order to gain knowledge of the presence of ESD in Nigerian junior secondary school education. Other reasons were to gain knowledge about schools' administration and management in Nigeria, as well as goals, standards and requirements of quality education delivery in Nigeria. The National Policy on Education informs us of the various levels of education in Nigeria: the subjects taught in each level, the planning, administration and supervision of education in Nigeria. Similarly, the junior secondary school curriculum gave insights on the subjects' contents, the activities to be carried out during the teaching of each topic, the teaching resources required for each topic and learning outcomes.

The primary purpose of education for sustainable development is to enable people develop the knowledge, values and skills to participate in decisions about the manner at which they do things individually and collectively, both locally and globally. In that way, they would improve the quality of their life presently without damaging the planet for the future. In this view, the contents of these documents were analysed based on the minimum UN standards for basic education in developing countries. As earlier stated in the methodology chapter, the curricula were developed by Nigerian Educational and Research Development Council (NERDC). This council is made up of educationist from different fields, their aim is to identify problems in education system in Nigeria and encourage research works in seeking for the solutions among many other responsibilities. They have the mandate to develop curricula for use at all

levels of educational system in Nigeria, the members of this council are directed by the National Council on Education (NCE) to restructure and re-align the school curricula for primary and secondary schools to meet the targets of nine-year basic education in line with the United Nations (UN) standards of basic education. They also put into consideration the outcome of National Economic Empowerment and Development Strategies-NEEDS. The strategy of NEEDS is to reorient values, reduce poverty, create wealth, and generate employment, through empowering people, promoting private enterprise. In outlining the plan for prosperity, it took NEEDS three years to come up with, “the vision for Nigeria, and the citizens’ expectations”. This was handled by dedicated team selected by the government. They held meetings and workshops to identify the expectations of the citizenry, the problem they face and possible solutions to these problems. This is one of the reasons the curricula had to be drawn from the NEEDS plan so as to address the needs of the citizens as well as the UN directives of basic education.

The National Council of Education, the body that supervises the activities of NERDC is made of the Minister of Education as the chair, state commissioners of education and the federal capital tertiary secretary as members. This council is the highest body for formulating education policy in Nigeria. They provide a forum for consensus building on education policy directions to be implemented at different levels of education with varying degrees of adaptations to suit specific state and local peculiarities. The Nigeria education policy was developed based on their level of anticipation for education in Nigeria. They started by identifying the present state of education in Nigeria, the problems surrounding good education delivery and how these problems can be resolved.

The UN through UNESCO has a vision to help achieve sustainable development by helping schools promote ESD actively by ensuring that young people obtain the knowledge and skills to be ‘active citizens for the new millennium’. The objective of UNESCO in this regard is to ensure that schools promote sustainable development by ensuring that students develop consciousness and understanding of the environment they live in; and secure their commitment to sustainable development on a personal, national and global level (Fien and Tilbury, 2002). In view of this, four subjects were chosen for this research, they are Basic science, basic technology, religion and national value, and cultural and creative arts. The curricula of these subjects were

selected to identify the complexity and interconnectedness of problems such as poverty, wasteful consumption, environmental degradation, urban decay, population growth, health, conflict and the violation of human rights that threaten our future as addressed in relation to meeting the Sustainable Development Goals (SDGs). The learning outcome, activities carried out during lessons and teaching resources used during the delivery of each topic in the curricula were also regarded in terms of it relationship in developing the knowledge and skills needed for a sustainable future as well as changes in values, behaviour, and lifestyles.

5.2.1. Basic science

The junior secondary school education curriculum on basic science indicates that human beings are at the hub of sustainable development, hence topics under this subject were classified under four themes which were; “you and environment”, “living and non-living things”, “you and technology”, and “you and energy”. These topics aimed to help students understand the value of everything around them, both the living and non-living things, and to develop interest in science and technology; acquire basic knowledge and skills in science and technology and to enable them apply such knowledge and skills to meet societal needs.

The curriculum indicates that the students should develop interest in their local environment and be able to recognise features within their school environment. It gives them the opportunity to acquire skills necessary to keep safe in familiar and unfamiliar environments, for example washing of their hands to avoid diseases, identifying ways of improving their local environment by putting litter in the appropriate bins, and have knowledge of basic needs such as clean water and food. It expects knowledge of the consequences of one’s action on the environment; that is how the action can improve or damage the environment. The curriculum indicates the ability of students in recognising that environment can change naturally and also this ‘change’ can be influenced by human. The curriculum also indicates that students should appreciate the variety of animals and plants, locally and globally thereby encouraging biodiversity in the school compound or environment. It encourages students to have sense of bewilderment about the complexity, diversity and interdependence of living things. The curriculum also reveals that students are encouraged to take action in improving their

environment both in school and in the community; making them aware of their interdependence. It is also observed that concepts like health, environmental degradation and urban decay underpins the basic science curriculum and it indicates that the teacher should guide the learners in discussions about their hygiene and home cleanliness, maintenance of personal cleanliness and disadvantages of poor personal hygiene. Knowing different diseases and their prevention, the use of drugs and when it becomes an abuse (see appendix 2.1) Each topic in the curriculum indicated the appropriate teaching aid to be used in order to better convey the content of the curriculum to the students.

5.2.2. Basic technology

This subject was made compulsory because the NERDC envisaged the subject would contribute to the achievement of the national education goals. Due to present trends in education, basic technology became necessary in orientating the teaching of technology as an integral part of world globalization. The objective of NERDC in developing this curriculum is to allow the students acquire technological literacy that would enable them function both locally and globally. The curriculum was designed in a way that teaching and learning were facilitated by use of real life experiences through industrial visits, use of information and communication technology, instructional materials and other audio-visual aids.

The curriculum encourages the students to gain knowledge of technology and its contribution to human living. It creates safety rules and regulation inside a workshop and its importance gives the students' knowledge of different safety measures. Knowing the difference within and between renewable and non-renewable resources, materials and their properties, and also the various ways in which energy is used. The content of the curriculum indicates that students are made to be aware of the process of building houses, materials and tools used in building. The students at the end of three years of learning this subject should know the basic material maintenance practices, the use of instructional manuals, troubleshooting or fault detection (see appendix 2.2).

5.2.3. Cultural and Creative Arts

The NERDC in the interest of the nation thought that since society is dynamic, therefore, there is a need for regular review and restructuring of the curriculum to meet with the ever changing needs, challenges and aspiration of the society. (Igbokwe, 2015). In view of this the cultural and creative art curriculum was reviewed and restructured in order to infuse emergent issues that are of national and global concern such as gender sensitivity, globalization and entrepreneurship. The curriculum was developed under three basic themes, which are “arts and crafts, performing arts and entertainment and customs and traditions”. The curriculum indicates that students should be taught how to use materials around them, for example paper, wood, beads among others in producing household utensils. It also indicates that practical steps of each method of production should be carried out. Topics like teamwork and sense of belonging, consequences of using adulterated goods, and discipline make up the customs and traditions theme. The teacher is meant to explain the meaning of teamwork and its importance and allow the students to dramatize how to achieve teamwork. The teacher should also explain the meaning of fake goods and the consequences and effects of producing sub-standard goods. Discipline in classroom, school environment and community is also part of this curriculum (see appendix 2.3).

5.2.4. Religion and national values

The subject was formerly known as civic education but due to the complaint that the curriculum is congested, four subjects were merged into Religion and National Values (Igbokwe, 2015). This subject is a combination of religious studies, civic education, social studies and security education. Topics for this subject centred on honesty, regard and concern for the interest of others, justice, discipline, right attitude to work, courage and national consciousness (see appendix 2.4). According to Igbokwe (2015), the essence of this is to ensure students have the right values necessary to function in the community/society, knowing that their action can improve or change their environment. The curriculum creates awareness of differences in quality of life between tribes in the country. It also makes the students aware of individual or collective responsibility in ensuring fairness in the world.

In conclusion, there is evidence of cross-curricular mapping, independent styles of learning, children developing their own critical thinking skills, being active in classroom, school and community and learning to make decision. The seven fundamental concepts which underpin ESD are visible in these curriculum and if followed diligently it may encourage the effective implementation of WSA model to work perfectly. These concepts are as follows;

- Citizenship and stewardship

  The curriculum helps the students to recognise that they have rights and responsibilities to participate in decision-making, thereby having a say in what happens in the future. And the willingness to act as responsible citizens whilst developing the ability to engage with and manage change at individual and social levels. It also states clearly the connection between personal values, beliefs and behaviour. This allows for active participation in school's decision making.

- Sustainable change

  The topics in the curriculum teaches the consequences of unmanaged and unsustainable growth, its effects in terms of increasing poverty and hardship and the degradation of the environment due to increase in population, which is to the disadvantage of everyone, hence makes the students to understand how their home and school may be managed sustainably.

- Needs and rights of future generations

  The curriculum indicates the consequence of our actions presently and in the future, therefore discourages wasteful living, violence in the community which could lead to damages.

- Interdependence

  Some of the topics found in the curriculum indicated an understanding of the connections and links between all aspects of people's lives and places at a local and national level, and that decisions taken in one place will affect what happens elsewhere. Thereby encourages the students to develop an

understanding that living things depend on each other and should acquire a sense that all living things have value.

- Diversity

  The curriculum shows the importance and value of diversity in people's lives – culturally, socially, economically and biologically – and realising that all our lives are impoverished without such diversity. It encourages the students to appreciate cultural and biological diversity in the school and community, so they can reflect critically on and engage in debates and decisions on political, technological and economic changes which impinge on diversity and sustainability.

- Uncertainty and precaution

  The curriculum teaches the students how to adopt a cautious approach to the welfare of the environment thus, develop the students' ability to think critically, systematically and creatively about issues in the community and seek for solutions and alternatives.

- Quality of life, equity and justice

  The curriculum advocates equity in what the students are doing, inspires them to develop a sense of fairness by understanding the essential difference between needs and wants. The curriculum also teaches the students to understand the difference between quality of life and standard of living and to seek a good quality of life for all people at both local and global levels. As well as appreciate the essence of equity and justice in achieving a sustainable society.

5.3 Field Work

The field work for this study took place in Rivers State, Nigeria for a period of six weeks. Four government owned junior secondary schools were selected as the case studies. These schools were located in four different local government areas, two in urban areas and two in rural areas. This was to ensure a good representation of data gathered because the schools make use of same curricula and policy. As previously

discussed face-to-face, semi structured interviews were conducted with teachers whose subjects were selected for this study, the head teachers in the four schools and their assistants and an official of NERDC. For anonymity, codes instead of real names were used for the schools and participants involved in this research. U1 and U2 represented the urban schools, whilst R1 and R2 represented the rural schools. The participants were identified with codes as shown below:

PU1 and VU1 – the principal and vice principal of the first urban school
PU2 and VU2 – the principal and vice principal of the second urban school
PR1 and VR1 - the principal and vice principal of the first rural school
PR2 and VR2 - the principal and vice principal of the second rural school
BS – Basic science teacher
BT – Basic technology teacher
CE – Cultural and Creative Arts teacher

CR – Religion and national values teacher.

5.3.1. Schools observation

As previously discussed, four schools were used in this study (see section 4.3). The general communication mode in these schools was English language and they all use the national curriculum government provided by the Nigerian Ministry of Education. Observation in the schools was a method of exploring the appropriateness of WSA framework in Rivers State secondary schools. More comprehensive descriptions on the characteristics of each school are provided in the next sections.

5.3.1.1. School U1

School U1 is the first urban school visited, it is located in the state capital. The school is a co-educational school, with students ranging between 11 and 16 years old. The school building is situated at one side of the compound, with a motorway in the middle, dividing the school building and the playground. The school compound is not large, it has two buildings with two levels each and fifteen classrooms. The buildings were old

and not well maintained. The floors of the buildings were cemented, and painted inside and outside though the painting is worn out. The researcher observed how poorly ventilated the rooms were, there were no fans or air-conditioning, in spite of the very hot weather. Each classroom harbours between 80 and 100 students. The furniture in the classrooms looked worn-out and some were broken. The desks were clustered and students were observed sharing desks. The classrooms had windows, but were not airy enough due to the number of students in the classroom. The principal's office is located between the classroom blocks, probably to be able to monitor the activities of the teachers and students because during the interview with the principal, it was observed that the principal monitored the movement of staff. The school had a computer laboratory for their computer classes, but no library, common room or cafeteria. The toilet facilities were in a bad state, not conducive for use and an easy way for diseases to spread because they were not kept clean. More so the majority of the teachers had their desks and seats outside, along the corridor due to insufficient offices for them, according to the head teacher. There is a staff room, but it was not ventilated, and so was not well ventilated like the classrooms. The school practiced teacher-centred approach to learning (see section 2.8), therefore for each lesson period that lasts for 40 minutes, a teacher goes into the class to teach according to the timetable, except for computer class which the students have to go to the computer lab in groups to attend the class due to limited number of computers in the school. The school is not connected to national power source, so has an independent generator supplying power to the laboratories and the principal's office. Interestingly this school was the only school with waste bins separated for different types of waste. They had a bin for general waste and a bin for bio-non-degradable waste. The majority of students in this school were from average income families. Their parents are literate and mostly civil servants.

5.3.1.2. School U2

School U2, situated in another town and local government council in the state was the second school visited in the urban area. The school is made up of boys only, with age range of the students between 11 and 16 years. It has a large school compound, though not fenced, so security is a concern. The community in which the school is situated harbours both residential and commercial activities. The area is quite noisy,

there is a road that links two parts of the community running across the school. The buildings are all unpainted bungalows, some with damaged roofs. The floors of the buildings were cemented, but inside the classrooms and staff rooms were not painted. The principal's office is located between two blocks of classrooms. In this school, the teachers have adequate offices, no teacher was seen sitting in the corridor, as in U1. The school had over twenty classrooms, but classes were still overpopulated. As with U1 each classroom accommodates between 80 and 100 students and some of them share desks due to insufficient desks in the classrooms. The classrooms have big windows, though the students complained of how hot the classroom can be and mentioned this as one of the things they dislike about the school during the focus group discussion. Despite the hot weather, it was observed that the classrooms had no fan or air-conditioning. Like U1, furniture in the classrooms were worn out and broken. The school has a computer lab situated close to the school entrance, and a library with reasonable quantity of books supplied by the state government. The school does not have a common room, or cafeteria. The playground is large and has a football pitch. The toilet facilities in the school were in a terrible state, not conducive for use at all and an easy way for diseases to spread. The school does not have a source of national power, therefore, a generating set donated by a communication company as part of their corporate social responsibility was used by the school to generate power for the laboratories. Similar to U1, the school practiced teacher-centred approach to learning. Small waste bins were seen in strategic position to prevent the students littering the school compound, also observed was a signpost directing people to where the bins are located. The school did not have separate bins for different waste and after generating the waste, it is thrown behind the school compound where it would be burnt later. Students in this school are mainly from average income homes.

5.3.1.3. School R1

The first rural school visited 'R1' is located in a community that harbours several multinational oil-producing and servicing companies, in addition to many other industries. The community is mainly made up of farmers. However, the oil spillage caused by the oil-producing companies has caused environmental degradation and also affected the quality of farm produce in the area. The school is a co-educational school with age range same as the urban schools. It is a large compound fenced

school, the buildings are clustered towards the end of the school compound, thereby giving room for a large playground. There are four bungalows in the school compound, one of the bungalows harbours the administrative offices including the staff rooms. Same as the urban schools, the classroom and furniture are not maintained. The classrooms had broken windows, and worn-out, broken furniture, also observed that the classrooms had no fan or air-conditioning, despite the hot weather and students complained about it during the focus group discussion as one of the things they did not like about their school. As compared to the urban schools, the students are less in number in classroom. This is as a result of youths in the community not interested in acquiring formal education, the vice principal admin confirmed the statement. The school buildings are in a very poor state and insecure for the students, the classrooms had neither doors nor windows, and the roofing is poor (see appendix 3.1).

Unlike the urban schools, where parents fund some of the facilities used for administration of the schools, parents of the students in the rural schools cannot afford to fund additional facilities, hence R1 does not have facilities like toilets (except for one beside the principal's office), a clean water supply or a generator. There was no library found in the school, no common room or cafeteria. Even the toilet next to the principal's office is not functional because there is no water supply, therefore, students and staff have to go to nearby bush for open defecation. There is a lager hall used as staff room, but the teachers were sitting outside because of poor ventilation in the hall. The school practices teacher-centred approach as seen in the urban schools. The school do not have source of national power therefore, there was no functional laboratory. No waste bins in the school compound, wastes were thrown behind the school compound. Students in this school are mainly from low income families.

5.3.1.4. School R2

The second rural school visited 'R2' is located in a community that harbours oil drilling company. The community is made up of majorly farmers. However, the oil spillage caused by the oil drilling has caused environmental degradation and also affected the quality of farm produce in that area. The school is a co-educational school with age range same as the urban schools. It has a small unfenced school ground, with three buildings. The school is very close to a major road, therefore poses danger to the students. There are two storey buildings and a bungalow which harbours the

administrative offices a small staff room. Same as the urban schools, the classroom and furniture are not maintained. The classrooms had broken windows, and worn-out, broken furniture broken and no doors to the classroom, because the doors have been broken by thieves and burglars according the vice principal (administration). It was also observed that the classrooms had no fan or air-conditioning, despite the hot weather and students complained about it during the focus group discussion as one of the things they did not like about their school. As compared to the urban schools, the students are in small numbers in classroom. The school buildings are in a very poor state and unsecured for the students, the classrooms neither have doors or windows with poor roofing (see appendix 3.2).

Unlike the urban schools where parents generate funds to provide some facilities used to assist the schools, the parents of the students in the rural schools cannot afford to provide some of the facilities, hence the school do not have facilities like generating set, toilets (except for the principal's office) and water supply as provided by parents of students in the urban schools. There was no library found in the school, no common room or cafeteria. Even the toilet found in the principal's office was not functional because of water supply, therefore, students and staff have to go to near bush to defecate. There is a larger hall used as staff room, but the teachers were sitting outside because of poor ventilation in the hall. The school practiced teacher-centred approach as seen in the urban schools. The school do not have source of national power, therefore, there was no functional laboratory. No waste bins in the school compound, waste are throw behind the school compound. Students in this school are mainly from low income families.

In summary, it was observed that the schools used for this study have poor infrastructural facilities for example poorly maintained buildings, no common rooms or canteen for students to take a break or relax. The classrooms are not conducive for effective learning to take place due to insufficient supply of desks and chairs.

5.4 Demography of interview participants

The table below shows the demography of interview participants. This is a set of information about their age, sex and educational levels. The purpose of gathering this data is to determine their qualifications and to explore if there is a relationship between years of service and level of commitment and competency. The results and findings

are discussed in the following chapter. On collecting the forms from the participants, it was observed that some did not indicate their age, probably they were not comfortable disclosing their age. Knowing their age is not as important as knowing their qualifications and years of experience therefore, it did not matter much for those that did not indicate their age.

Participants	Organisation	Area of expertise	Years of experience	Educational qualification	Gender	Age
PU1	First urban school	principal	10	Maters	female	
VU1	First urban school	Vice principal	10	Masters	female	
PU2	Second urban school	principal	10	Masters	female	50
VU2	Second urban school	Vice principal	10	Masters	male	
PR1	First rural school	Principal	30	Masters	male	
VR1	First rural school	Vice principal	30	Masters	male	
PR2	Second rural school	Principal	10	Masters	female	
VR2	Second rural school	Vice principal	10	Masters	male	
U1BS	First urban school	Basic science teacher	5	BSc	female	

U1BT	First urban school	Basic technology	10	BSc	male	
U1CE	First urban school	Civic education	5	BSc	male	
U1CR	First urban school	Christian religious studies	10	Maters	female	50
U2BS	Second urban school	Basic science teacher	5	BSc	female	
U2BT	Second urban school	Basic technology	5	BSc	male	
U2CE	Second urban school	Civic education	2	BSc	female	40
U2CR	Second urban school	Christian religious studies	10	BSc	female	
R1BS	First rural school	Basic science teacher	5	BSc	male	
R1BT	First rural school	Basic technology	6	Masters	male	40

R1CE	First rural school	Civic education	5	BSc	male	
R1CR	First rural school	Christian religious studies	10	BSc	female	30
R2BS	Second rural school	Basic science teacher	2	BSc	female	40
R2BT	Second rural school	Basic technology	5	BSc	male	
R2CE	Second rural school	Civic education	5	BSc	male	
R2CR	Second rural school	Christian religious studies	5	BSc	male	
C	NERDC	Head research group	10	Masters	male	

Table 5.1- **Demography of interview participants**
source: field survey, 2018

5.5 Five Strand of WSA

In reference to chapter three of this study, WSA framework was chosen for this study because it advocates a more promising way, to develop action-focused ESD. This is achieved through an effective expression of the curricula content to day-to-day practise in schools (Shallcross, 2005). WSA links formal education, informal education

and non-formal education, which suggests an efficient way of integrating all aspects of education, because it connects the teaching in the classrooms with, what transpires in other aspects of school and community life that influences learning. The hallmark of the five strands is to ensure that, the process employed in involving the whole school in practising sustainable development is monitored and evaluated for efficiency of the model. The theory behind this model was employed during the fieldwork of this study and the data is presented based on each strand.

5.5.1 Curriculum and pedagogy

ESD was considered as a means to enable people address present and future global challenges constructively and creatively, in order to build more sustainable and resilient societies. UNESCO in 2002 defined ESD as a vision of education that seek to empower people to assume responsibility for creating a sustainable future. It aims at improving access to quality basic education, reorienting education curricula, training and raising public awareness as well as helping people to develop the behaviours, skills and knowledge they need, now and in the future. In view of this definition this study investigates how teachers perceive the global issues because that would determine how well they can transfer the message to the students. In like manner, the state of the schools where the teaching takes place is another important aspects of effective implementation of ESD and as well as the way the learners accept the message. Available field data are presented below;

5.5.1.1 Teachers' Perception about Sustainable Development

The data gathered from the field helps in determining how well the curricula content would be translated into teaching. This is important because, the understanding of the students on their impact of their daily activities would help in attaining sustainable development nationally. It therefore serves as a precursor to seeking the teachers' views on global issues. The responses from the participants were important to corroborate the finding that the meaning of sustainable development is diverse and therefore could influence the way the teachers may communicate it on to the students or get involved in activities that promote sustainable development.

Table 5 – 2 summarizes the different meanings offered by the teachers on sustainable development. Three of the teachers interviewed in the rural schools, stated clearly that they do not know what it meant therefore, could not give their view on the concept neither could they relate it to global issues. Others did offer their understanding of sustainable development in four clear perspectives: i) preserving natural resources; ii) advancement in technology; iii) equity; and iv) political perspectives.

Table 5 – 2 - **Teachers' Perception about Sustainable Development**

Perception of sustainability	Quotations from interview transcripts	Research participants
No knowledge	"I do not know anything about global challenges or issues."	R2BS R2BT R1CT
Theme 1		
Preserving natural resources	"Non- renewable energy, those one that cannot last forever. How to manage the energy that will not last long, basically sustaining them."	R1BS
	"There is a tree outside there that the management wanted to cut down and I advised them to have a replacement before taking the action because of the consequences that can happen after.	U2BS
	"You know that waste is poisonous but we recycle waste. The polythene bag is recycled for ammonia, so those are useful waste we can make use of."	U1BT
Theme 2		
Advancement in technology	"like the global warming we are having is as a result of science activities"	U1BS

	"for me technological advancement has been of issues to us presently, take for instance Rivers State, the presence of oil and the drilling has caused us so much degradation environmentally" "industrial waste is the major problem faced in this state as well as in the world"	U1BT U2BT
Theme 3		
equity	"If we destroy the environment how will our children enjoy the benefits. Though the environment is already degraded but it is how to manage it so that it does not go beyond what we have now."	R1BT
	"The issue confronting the contemporary world that when we try to proffer solution to this issue it will go well with entire world."	R1CE
Theme 4		
political	"ozone layer depletion is natural; we cannot do not anything to prevent"	U2BT

source: field survey 2018

5.5.1.1a. Preserving the natural resources

Some research participants perceived sustainable development as a means of preserving natural resources, though from two differing angles. R1BS and U2BS took the approach of the impact of using the natural resourcing carelessly therefore, suggests an immediate replacement to avoid running out of stock. While U1BT, is of the view that recycling could help preserve the natural resources (see table 5.1)

5.5.1.1b. Advancement in technology

U1BS states that the concept of sustainable development came about due to global issues presently facing the world which is as a result of advancement in technology. According to U1BS, scientific activities have caused an increase in carbon emission which has depleted the ozone layers. He said “The heat of the sun presently is so much that one’s skin hurts so much”.

5.5.1.1c Equity

Some participants defined the concept of sustainable development to mean “equity”, though with two different perspectives. R1BT was of the view that there is need for us to be fair on our activities that affect the environment so that both current and future community members can benefit from it. In his term, he said “though the environment is already degraded, but how do we manage it so it does not go beyond the present state. Because if we are not careful how we use our resources, it might not be enough for us, so what happens to our children and grandchildren?” Meanwhile, R1CE is of the view that sustainable development is about seeking solutions to the present issues facing the globe so as to meet the needs of everyone in the society, that way there will be justice and people would not need to fight themselves.

5.5.1.1d Political

U2BT perceived sustainable development as a political concept. He said “Ozone layer depletion is a natural phenomenon”, therefore why the concern about it? People come up with different ideas to suit their personal agenda. He is of the view that those in power are creating problems in order to see ways of misappropriating government funds.

In spite of the similarities and differences in the perception of the concept of sustainable development amongst participants, one common thread that runs through the majority of the views is that sustainable development has to do with the prudent use of resources, ensuring an inter and intra-generational equity, that is resources are used to meet the needs of present and future generations. Inherently, the respondents

are in agreement with the traditional definition of sustainable development as indicated in chapter 2. In some, the resource-based meaning of sustainable development was prominently featured in the respondents' responses except "attitude", which was subtly mentioned. Another notable point is that they focused on the social and environmental aspects of sustainable development, leaving out the economic aspect. This could possibly mean that people are more interested in their environment and social life, which would eventually reflect on their economic life or the connection between the three pillars is not obvious to them.

5.5.1.2. Teachers' view on the state of ESD in Nigeria

The state of the schools where teaching and learning takes place is crucial to this study because it stimulate, motivate and facilitate teaching and learning activities. Data was gathered from the teachers and students on the state of the schools in terms of achieving ESD and the findings are presented below;

Table 5 – 3 summarizes the different the view of the state of ESD in the schools used as case study. Four strong perceptions of the state of education in Nigeria emerged from the interviews with the teachers. These perceptions are; i) learning and teaching resources, ii) infrastructure, iii) remuneration and welfare, and iv) effective teaching.

Table 5-3 - **Teachers' view on the state of ESD in Nigeria**

Emerged Themes	Quotations	Research participants
Theme 1		
Learning and teaching resources	"now there are some materials you need to explain to the students what they really need to understand but we do not get it", "I am moderately satisfied because there are no teaching aids for use in teaching the students" "Example when we do not have teaching aids, We also have the issue of power supply because some of the	R2BS

	topics need power to help illustrate things." ", after school some bad guys come into the school to urinate anywhere and it is affecting their health."	U2BS
Theme 2		
Infrastructure	". Though we do not have lab for the students to see what they are being taught. We lack teaching aids which is not encouraging." ". I am not trying to diminish the government but look at the school, you see the poor state of the classroom, salary are not paid at when due" "We make use of crude methods of getting water, we dug well. In this school we do not have any toilet facilities here, we go to the bush when we are pressed."	U1BS R2BT R2CR
Theme 3		
Remuneration and welfare	"Teachers' welfare is very poor, am sorry to say this but we are not motivated. They promote you but it not reflected in our pay or incentives"	U1BS

	", the salary does not come as at when due this demoralises me. And it affects us in carrying out our duties."	R1BT
	"I do go for personal training to improve myself though the government organises training for science teachers once every two years"	R1BS
	"the pre-service training I had was not enough to help me teach, I do learn on the job, I have been told that training happens every two years, and I have worked for barely two years, so I hope to go for training soon"	R2BS
	"I have worked for five years and have never gone for any in-service training. A workshop was organised some time ago but I was not selected to attend"	
	"though the pre-service training was useful to me but one needs to keep upgrading because these students are becoming very advanced"	U1BS
		U2BS
Theme 4		
Effective teaching		U2BT

	“We have about 100 students in a class and it also affects how we teach” “. In my own subject, I have about 40 students at a time to teach” “The teacher/student ratio is about 1:60 at each teaching period, it can even be more”. “That we don’t have necessary facilities that will enable the children understand the topic.”	R2RE R2BT

source: field survey 2015

5..5.1.2a Learning and teaching resources

From table 5-3 clear expressions of disappointment are recorded by the teachers on the poor state of education in the country. R2BS is of the view that teaching science with inadequate resources does not allow the students to engage well with their learning. U1BS, U2BS are of the view that school environment needs to be simulative and conducive to learning, in that way students can be easily guided through the discovery of knowledge on their own. The importance of learning with teaching aids cannot be overemphasized according to R2BT because they create a visual and interactive experience for the students.

5.5.1.2b Infrastructure

Poor infrastructure shapes student outcomes. R2BS said that since their school does not have windows and doors, it serves as a shelter to “bad boys” around the area. They urinate and defecate in the classroom, which is an obvious cause of disease to the students. This shows a lack of respect for education and for the community. Also students are exposed to harsh weather, which cause them to fall sick and miss classes resulting to poor performance. U1BS says that teaching science subjects without a laboratory to perform necessary experiments undermines student engagement because they do not understand what the teacher is teaching. U2BS says “that lack of power supply to school affects teaching and learning, teachers’ staff room are not conducive because they lack air conditioners, knowing how hot the temperature can get at times”. In support of the view, U2BT said that the classrooms are in horrible conditions.

5.5.1.2c. Remuneration

Rewarding an employee in the form of wage including allowances, increases the interest of the teacher in carrying out his/her duties, because it makes the teacher feel valued and respected. In U1BS’s opinion, “teachers are not motivated to perform their duty because their wage is very poor”. In support of U1BS, U2BT said that “not only is the wage poor, it is irregular”. According to R2BT the late payment of wage demoralises teachers and affects them in carrying out their duties. They went further to say that teachers are hardly promoted and when they are eventually promoted, it does not reflect in their wage.

5.5.1.2d Effective teaching

“The ratio of teachers to students in Nigerian schools is not encouraging and it affects our delivery” says U2BS. “We have about 100 students in a class, most times whilst teaching is going on, majority of the students are engaged with other activities that does not relate to what is being taught”. “It is difficult to get round the students to monitor their level of engagement while teaching says R2CR”. However, R2BT says “I can manage my class effectively because there are about 40 students”

From the findings, it can be concluded that there is poor state of ESD in Nigeria, due to the views of the participants on teaching resources, infrastructure, remuneration, and effective teaching.

During the fieldwork, it was observed that the teaching techniques in the schools were basically teacher-oriented. Most of the lessons were teacher driven with little participation from the students. The VR1 attributed this to the students' lack of interest in learning, he said that:

"The students are not interested in education, I would say that over 70% of the students are not serious, all they think about is how they can own big car and house. They just want to be rich without working hard for it. They indulge in cult activities, though you see them in school, most of them are not willing to learn, they just come school to play".

VR2 said, "We do beg them to read their books after schools so as to make contributions when lesson is going on but due to the economic situation in the country presently most of them have to help their parents after school in trading to meet up the family financial demands, these things contribute to their poor performance in school".

According to the teachers in the rural schools, active learning is not encouraged in the school because the students cannot contribute to the topics they have no knowledge of. However, the situation is not same in the urban school, though the urban schools do not fully practice a student-centred learning, there is room for collaborative learning. Over 80% of the teachers agreed that school should prepare the students for a fast changing and globalised world.

Students learning and understanding in order to make informed decision is the hallmark of re-orienting education curricula, and also to accommodate sustainable development principles and ESD objectives. During the fieldwork it was gathered that students find it difficult to relate classroom learning to their daily activities. Nevin (2008) stated that ESD is not a new programme, rather a clarion call for educational policies, programmes and practices to be re-oriented so that education can play its part in building the capacities of all members of the society to work together to build a sustainable future. The general view of students is that "because we have to get on with the next thing" we are being rushed to complete our work even when we do not understand it – not having time to think of solutions on their own was viewed negatively

by the students. Some also complained that they felt pressurized to complete their work in school and it makes them unhappy. Findings revealed also that some of the students were not able to relate classroom study to the things they do practically.

5.5.2 School culture and ethos

Collaborative and caring approach was very evident in U2 leadership team. During the interview the head teacher was asked what her reaction would be if students should report a teacher's wrong attitude towards them. She recounted a scenario she witnessed a teacher bullying her students in class. The teacher was called into her office for discussion and in the process she realised that the teacher was emotionally challenged and so she had to deal with the emotional challenge first. In her words she said "I do counsel my teachers occasionally, I prefer to engage in discussion instead of issuing query to the individual". She also said that teachers and parents were involved in decision making, though the leadership does not involve the students when decision are made but they also try to create a sense of belonging to them by constantly relating their decisions to them. Her leadership style is evident in the attitudes of the teachers as they were seen to be more dedicated to their duties more than the other schools.

In the U1, the findings revealed an autocratic style of leadership and very strict to government policy even when it does not work well with the school. When asked if teachers and students are allowed to contribute to the running of the school, her response was "except their suggestion is in line with the ministry of education and she gets an approval from the ministry, the suggestion would not be attended to"

In the rural schools, there was no evidence of structured school culture or ethos. According to the PR1, due to irregular payment of salary, the teachers tend to do what suits them and he cannot do anything because he cannot fulfil their needs. And same goes to the second rural school. Teachers usually come late to school and were seen in groups discussing.

Positive relationships amongst and between school staff and students, together with absence of bullying, were significant contributory factors in students' enjoyment of school. Where such relationships dominated, the students considered that this created

a positive atmosphere and contributed to students' having a sense of security within school. Some of the students reported bullying from their senior students as part of the things they hated about their school.

Also, segregation practices among students tend to make some feel inferior and less important than others. Students accepted to be treated equally and make everyone feel special. They complained about some teachers being moody, and speculated that perhaps the teachers do not like the job and so they always shout at the students during classes, these affects their satisfaction of being in school and makes learning very difficult.

5.5.3. School practices

It was observed that the leadership in some of the schools follow the government policy/document rigidly in managing the affairs of the schools. They do not consider the needs of the immediate environment. However, the U2 leadership felt that the government document is a foundational principle that can be developed depending on the environment or culture of people where one finds him/herself. She was of the view that addressing the purpose of the curriculum provided by the government meant deciding as school what is important to the students within a particular community. She said "my focus is on developing my staff and students to enable them engage as active citizens". In her view, a healthy social and emotional skills can reduce the chances of challenging behaviour and prepare the students for challenges of life. She went further to say that, the amount of autonomy given to students, the degree of responsiveness to their views and the extent to which they rely on authoritarian discipline techniques, builds their self-esteem and prepares them for the future. The school actually practiced a friendly environment more than the other schools used in this study.

5.5.4. Monitoring and evaluation

It was generally observed that, there was little evidence of evaluation of how effectively the learning had impacted on the values and attitudes of students. When teachers were interviewed about the topics they had taught the students and the impact it has

made on them. Their responses generally were that attitude change is a gradual process, and would be evident in the long run. U2CR believes that the students are gaining knowledge. In R2T2's view, the students are evaluated through written test. U2T1 said "If learning is to be improved so as to make on values and attitudes, then it will be necessary to address evaluation and monitoring of teaching practices".

Findings revealed that students were assessed solely on skills that can be measured by pencil and paper assessment, which does not agree with the objectives of ESD.

5.5.5. Community links

There was an evidence of the school management working closely with parents to ensure the wellbeing of the students. PU2 said,

"You see those students outside with their parents, I saw them wondering outside the school compound during school hours and so I asked them to bring their parents to school. This is to make their parents aware of their ward's activities. I feel this is a better way of dealing with the students rather than suspending them from school because of their unruly behaviour".

According to VR2, the school leadership/management rarely get involved with the community. He said "we do not really get involved in community development because of funds. The only time we went out to the villages to campaign on the importance of education so they can allow their children to come to school, saw positive result but due to lack of support from the government, the school does not commit to community links". The urban schools have termly meeting with parents where issues concerning their children are raised and discussed. According to VU2, it was during the parents/teachers' meeting that parents agreed that each student should pay certain amount of money to enable the school procure diesel for the generating set and provide a burglary proof for the computer laboratory. Though, there is an evident relationship between parents and the schools' authority but it is limited to certain areas that does not necessarily translate the message of sustainable development to them.

Fundamentally, the findings of this research shows that there are potentials of ESD contributing to national sustainable development but are these potentials explored? It

also presents how well WSA could be appropriate in junior secondary education in Rivers State. These findings are extensively discussed in the next chapter.

Chapter Six – Discussion of Findings

6.0 Introduction

This chapter interprets the findings from the primary data, as well as the secondary data, and relates the interpretation to the literature review discussed in chapters 2 and 3 of this study. As previously stated in chapter one, the framework for this study is the five strands of Whole School Approach (WSA). WSA is employed to comprehensively deliberate on the findings of the data gathered during this study. WSA ensures that sustainability is embedded in a school's learning and teaching activities, culture, management structure, and management of the school infrastructures. One of the key features of the five strands of WSA framework as developed by Shallcross (2003) is the monitoring and evaluation aspect. Education for sustainable development (ESD) is one of the means of creating awareness of the imminent danger of the Anthropocene era on the planet. Therefore, a key challenge in ensuring effective implementation of ESD is to assess changes in competences and attitudes, taking place as a result of the integration of sustainable development concepts and values into the learning process. This key feature distinguishes Shallcross's WSA framework and allows for a plan-do-review process. The interpretations of the findings are discussed in the following order: formal Curricula and pedagogy, school culture and ethos: social and organisational aspects, institutional practice: technical and economic aspects, monitoring and evaluation and finally, community links and this reflects the five strands of WSA.

6.1. Formal Curricula and pedagogy

Within the WSA, formal curriculum and pedagogy are re-designed to address and support the goals of sustainable development as well as achieve the ESD objectives. This strand is very crucial in ensuring that education plays its role in creating awareness of sustainable development to the larger population as argued in chapter 36 of Agenda 21. Themes of sustainable development and ESD need to be infused into the curriculum, and the approach employed in delivering these topics determines how well the students can apply classroom knowledge to the real-life situation. This strand has been sub-divided into three themes: reorienting the curriculum to suit

sustainable development, teachers' qualification and effective teaching aids. This sub-division was done to understand the findings of this study effectively.

6.1.1. Reorienting the curricula to suit sustainable development

Within this strand, the importance of re-designing the formal curriculum to support the values of sustainability and ensure that the pedagogy employed drives this home. As discussed in chapter 2, this study assumes this strand to be most important because as ESD cuts across all subjects, it will be able to connect these subjects to practical activities is very vital. Shallcross et al., (2007), advocated that curriculum should reflect immediate issues of the local community since sustainable development problems and solutions differ from one community to another.

Key findings: the documents analysed in this study (National policy on education and junior secondary education curricula of four subjects) indicates that;

a. The curriculum was developed with the mind of achieving the goals of sustainable development and the learners acquire the objectives of ESD.

b. The policy addressed key items for effective ESD implementation such as; the student-teacher ratio (40 students per class), teaching approach to be practical exploratory and experimental approaches, teacher qualification and professional development. Also addressed in the policy is the provision of ideal infrastructural facilities in the schools.

Implications of the findings:

The strategic aim of ESD is reorienting the entire school systems (curricula priorities, policy and practice). Briefly, in ESD, learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods were addressed. Also, addressed in ESD is the manner to participate in a democratic society and live in a sustainable manner (McKeown, 2002). The Nigerian junior school curricula address learning skills, perspectives and values that guide and motivate students to strive for sustainable livelihood. The curricula, also explain ESD themes such as lifelong learning, multicultural education, empowerment and interdisciplinary education, the use of appropriate teaching approach for ESD as indicated in section 2.9. is presented, see

appendix 2.1C (Basic science), the objective of the topic addresses the goal of sustainable development meaning that the students are made to be aware of the consequences of their activities to the environment. Their actions can either positively or negatively affect the environment. The objective, also indicates that the students are taught different kinds of waste and how these wastes can be disposed of adequately. Also, indicated in the curriculum is the implications of either disposing or not properly disposing of the waste. It also showed how the teaching of the topic should be carried out and the learning materials needed for the topic.

For example, ESD is all about lifelong learning, according to Selvi (2011), lifelong learning is equipping students with skills and competencies that they require to continue their self-education beyond the end of formal schooling. In other words, the school curricula should reflect teachings crucial for the democratic, social, technological and economic development of societies. Of which, the subjects chosen for this study indicate the presence of democratic, social, technological and economic development of societies, and it also shows activities that would equip the students with skills and competencies necessary to continue life after school. For example, the basic science subject shows topics that aim at helping the students understand the value of everything around them and help them not only acquire basic skills in science and technology but also to apply such knowledge and skills to meet societal needs, particularly in their local environments. The basic technology curriculum was designed in a way that use of real-life experiences facilitates teaching and learning; in that way, the students would appreciate the knowledge acquired and apply them later in life. One of the important parts of the curriculum is the teaching of renewable and non-renewable energy resources, which is the crucial challenge being faced globally. The content of the curricula empowers the students for the future by teaching them the various ways energy is used and conserved effectively. The cultural and creative art curriculum was developed to reflect one of the themes of ESD, emergent issues of national and global concern were infused in it to address issues like gender sensitivity, globalisation and entrepreneurship. The curriculum indicates that the students should know how to use materials around them to produce some household materials, though during the fieldwork for this study, it was evident that practical classes do not hold due to inadequate teaching resources; this is discussed in full detail in section 6.1.3. Topics like teamwork, which would encourage collaborative learning are evident in the cultural

and creative art curriculum, though it does not happen in the rural schools. The students in U2 confirmed that collaborative learning gives them room to learn more because ideas are shared among students. The religion and national values curriculum was designed for the students to learn the values deemed necessary to function effectively in the community and society at large. Religion and National Values helps them to be aware of individual and collective responsibility in ensuring fairness in the world. The curriculum also indicates that teachers should lead the students in discussions to build students' knowledge and collaborative learning. Though this type of student-centred activity was not evident during the classroom observation, rather a teacher-centred learning approach was seen being used in delivering lessons to the students. Critical analysis of the curriculum shows that the curriculum developers incorporated a student-centred learning approach in the curriculum, to ensure that the students acquire the basic competence required such as critical thinking, and being able to imagine future scenarios and make an informed decision. The junior secondary school curricula reflect back to local environmental, cultural/ social and economic conditions suitable to each topic to enable the students to understand and appreciate the topics in the subjects (see appendix 2.1). McKeown, Hopkins, Rizi and, Chrystalbridge (2002) advocated that the best practice for curricula developers is to adapt and modify the curricula to become locally relevant and culturally appropriate. The junior secondary education curricula reflect that it is culturally appropriate and locally relevant by accommodating local needs, perceptions, and conditions because the Nigerian Educational and Research Development Council (NERDC) recognise that fulfilling local needs has global effects and consequences. And as well recognised that ESD is not a 'one size fits all' and cannot be imported from other cultural, economic, or geographic region. The curriculum developers in Nigeria tried to engage formal, non-formal, and informal education (see appendix 2.1C) knowing that ESD is a life-long endeavour which satisfies the evolving nature of the concept of sustainability. The curricula incorporate the three aspects of sustainability – environment, society and economy. The Nigerian Junior secondary school curricula indicate a continuation in the topics taught across the junior secondary school (JSS) class one to JSS class three. The junior secondary curricula indicate the presence of life skills. These life skills knowledge aims at helping the students become more competent in dealing with the present society and the challenges of sustainable development in three categories. The first category is cognitive skills; these include

critical thinking, problem-solving, consequence identifying, decision-making, creative ability, self-awareness, goal setting and valuing. The second category deals with skills to help cope with emotions, which are motivation, sense of responsibility, commitment, stress resistance, emotion control, self-managing, self-supervision, and self-adaptation. The third categories, social or interactive skills; which are communication, assertiveness, negotiating/refusing, positive listening, cooperative skills, sympathy, and ability to recognise others goodwill.

6.1.1.1. The policy addressed the student-teacher ratio (40 students per class)

The national policy on education states that a class should harbour at most 40 students at each teaching class. Conversely, it was observed and also confirmed by the teachers during the interview that the classes are congested. U2BT reported that he has about 100 students in his class and this affects his teaching because most of the students are not adequately engaged when lessons are going on. During the focus group discussion, this over congestion in the classroom was raised by the students as some of the things they dislike about their school because it affects their ability to learn well. The implication of this is that transformative learning would be lacking in the life of the students because the students would not be knowledgeable in the topics they are being taught in class. A study carried out by Tobih, Akintaro, and Osunlana, (2013) on four government junior secondary education schools in Nigeria on the effects of class size on academic performance revealed that the number of students per class plays a crucial role in determining the academic performance of the students.

6.1.1.2. Teacher education is a prerequisite to gaining employment as a teacher

Paragraph 70 to 79 of the 2014 national policy on education dealt on teacher education. Paragraph 70 states that no education system can rise above the quality of its teachers, therefore, due attention should be given to teacher education in Nigeria. The policy indicates that the minimum qualification for entry into the teaching profession for secondary school should be Nigeria Certificate in Education (NCE). In paragraph 71, the goals of teacher education which are to produce highly motivated, meticulous and competent teachers. Provide teachers with the intellectual and

professional background adequate for their assignment and make them adaptable to changing situations. The goal also states that teachers would be encouraged to have a creative spirit. In the other paragraphs, the condition of service was stated; all teachers' in educational institutions shall be professionally trained; this means that teacher education programmes shall be structured to equip teachers for the effective performance of their duties. In-service training shall be developed as an integral part of continuing teacher education in Nigeria and promotion opportunities shall be created to allow for professional growth at all levels and so on.

This empirical research investigation reveals that only five out of the sixteen teachers interviewed had a teacher education qualification; these five reported that the knowledge obtained from the teacher education was not sufficient for teaching their various subjects. The other eleven teachers are university graduates who did not go through teacher education qualifications; they went into teaching because of unemployment issues being faced in the country (see section 5.5.1). The teachers also confirmed that they seldom go for in-service training. U1BS reported that ''I have worked for five years and have never gone for any in-service training. A workshop was organised some time ago, but I was not selected to attend". U2BS said, "though the pre-service training was useful to me one needs to keep upgrading because these students are becoming very advanced."

In fact, for R1BS, to remain relevant as a teacher, one has to be going on personal, professional development. He said I do go for personal training to improve myself because the government organises training for science teachers once every two years". These results imply that the tendency of inadequate delivery of lessons is high because as the policy clearly stated one cannot teach what she/he does not know. Secondly, a report from the UN Member States on teacher education responded to efforts being made to include ESD in teacher education, revealed a rise from 'in progress' in 2005 to 'full implementation' in 2013. The report also indicates that ESD in teacher education improved and increased during the DESD, as UNESCO strived to reorient teacher education curricula, programs, practices and policies, to address sustainability (UNESCO, 2013). For teachers that were trained before the introduction of ESD,

In-service training was advocated for the teachers who were trained before the introduction of ESD programmes were developed to enable them to develop all the capabilities they need to help their students achieve the objectives of ESD.

6.1.1.3 Teaching approach to be practical exploratory and experimental approaches

In the Nigeria secondary education curricula, the teaching approach to be used during lessons in schools were specified. Teaching approach such as practical exploratory and experimental approaches was advocated to be used. Also, the use of field trips where necessary was indicated. However, it was observed during the fieldwork that teaching approach employed in the schools was mostly a teacher-centred approach. During the interview sections with the teachers, R2BS said ‘’as a science subject, there are some materials needed to use and teach the students, to make the learning real and interesting but the government does not provide these materials’’. She also complained that even though the curriculum has specified materials and approach to use during classes but those teaching aids are not made available, even fund for field trips are not accessible. In such situations ‘’I get frustrated in teaching’’. Another teacher, U2BS, said that apart from the fact that teaching aids were not provided, there was no power supply to the school. The generating set in the school is used only to generate power for the computer lab, and it is only used during computer classes. A survey carried out in the Niger Delta region of Nigeria by Hamilton-Ekeke (2007) on the effective teaching approach to be employed in secondary education in Nigeria, revealed that students that were taught using student-centred learning acquired more knowledge and could apply it more than students that teacher-centred learning was used. Teaching aids are necessary for addressing ESD centred curriculum because it encourages critical thinking. As previously discussed in chapter 2, developing critical thinking in students is difficult to achieve with teacher-centred educational pedagogies. Audio-visual resources, such as charts, maps, flashcards, bulletin boards, and an overhead projector to show slides, TV and films, could play an essential role in student-centred teaching and so encourage critical thinking. This is because audio-visual resources can help to make a lesson interesting by communicating relevant information clearly, and so motivate students to engage with deep learning. As

Nigerian curriculum addresses ESD, without useful teaching aids, the objectives of ESD will be challenging to achieve. The schools used for this study were severely lacking in teaching aids (see section 5.3).

In summary, it is evident that the junior secondary education curriculum as indicated in the document was designed to meet the targets of 9-year basic education in the context of the National Economic Empowerment and Development Strategies (NEEDS) and the Millennium Development Goals (MDGs) as discussed in chapter 4. The policy document in paragraph 9(i) states that Nigerian education system is structured to develop the practice of self-learning, which meets the goals of sustainable development. However, there is a gap between theory and practise in these schools used for this study, and there could be a possibility of this situation occurring in other government established schools.

6.2 School culture and ethos: social and organisational aspects

School leaders to a great extent determine the culture and ethos of the school. Culture and ethos of a school are the values and beliefs that define a school. The manner in which activities are carried out in a school is as a result of what the school leadership consider as being valued. School leaders have a crucial role to play in ensuring the success of a WSA. Whatever practised that would address a sustainable lifestyle has to start with the school, so the students can relate curriculum content to real-life situations. Schools vision need to be evident in all its procedures, policies and support structures.

6.2.1 Leadership style

The key holder within the school can act as either a motivator or a barrier for the implementation of the WSA framework. Thus this can be considered as a local bottleneck. During the observation in the schools, U2 head teacher among others was the only head teacher that was not prepared to welcome any change in her school. During the interview with U1 head teacher, she was asked if she would encourage any

teacher or students who came up with innovative ideas in the school and she responded that she would not encourage unless the idea came from the state education board. It was also observed that her relationship with the teachers in the school was not cordial. According to (Harris, 2002) a capable leader develops realistic strategies to quickly create knowledge. Therefore, the successful implementation of a new educational trend will require responsible, and accountable leadership that is expert in both systemic educational change and sustainable development. The head teacher of U2 said that the government document is foundational principles that can be developed depending on the environment or culture of people where one finds him/herself. She is of the view that addressing the purpose of the curriculum provided by the government means deciding as school; what is important to the students within a particular community. She said, “my focus is on developing my staff and students to enable them engage as active citizens”. A report by UNESCO (2011) advocated that effective implementation of ESD centres on the motivation, commitment and support of the school leadership that accommodates teachers who implement ESD pedagogies. Despite, the irregular payment of wage, the teachers in U2 showed motivated and responsibility in delivering their duties. In Oman, it was recounted that the challenge to ESD integration in teaching and learning is the lack of teacher incentives (UNESCO, 2011). According to Stokes, Edge and, West (2001), as soon as ESD content and pedagogy lack plan by school leaders, the quality of ESD teaching will depend on the ideology and personality of individual teachers. The smooth implementation of ESD in such context into classroom teaching and student learning is undermined (UNESCO, 2011). UNESCO (2011) report advocated that school systems can follow less rigid approaches to integrate ESD content in the curriculum and develop flexible teaching and learning approaches

6.2.2 Active participation

Students in U2, where there was a good relationship amongst the staff and the students, gave a favourable report about their teachers as fair, respectful, caring and encouraging and rated their peers as cooperative and friendly. The students were significantly more likely than those in the rural schools to make more favourable comments about their school and to describe the general atmosphere of their schools

in an affirmative way. The students in U2 felt valued, cared for, respected and listened to in school, and they recognised that staff were genuinely concerned about their well-being. According to a study carried out by John-Akinola, Gavin, Higgins, and Gabhainn, (2013) of school children reported that positive interpersonal relationships and feeling a 'sense of belonging' were two aspects of the children school experiences which were significant in contributing to their feeling as members of the school community. When the students were asked more generally what they liked about their school, responses from the urban school showed 'having friends', 'playground for football', and 'teachers'. Students from R2 said they prefer the new press club created by one of the teachers because it gives them an opportunity to discuss pressing issues.

Another study carried out about young school children by Hart (2013) revealed that school children like to be active learners and to be involved in hands-on activities as important contributory factors to the enjoyment of learning in school. The study concluded that school children enjoyed and were motivated by lessons when the following conditions were in place: activities which require participation; an appropriate teacher-discussion; appropriate social demands made by activities, opportunities for challenge and struggle; a fair, decisive and psychologically safety regime. The students who took part in the focus group discussion generally liked to be challenged, they prefer to find a solution to issues themselves rather than being assisted all the time. One said, "you learn loads when you do it yourself".

Students are not motivated, however, when they considered teachers over-talk, with students expressing their perception that most teachers 'talk too much'. Student believes that the 'talking too' much causes them not to finish their lesson on time. Students were also not satisfied when they do not have variety in teaching styles and bored with long lessons and unpredictable routines. They also felt demotivated where their time in school and lesson involved too much writing, copying and repeating work. One of them said, "I feel frustrated when I am not challenged".

For students to reach their full potential in learning, the schools need to create a conducive environment for learning (Sebba and Robinson, 2010). Setting a clear learning goal and success criteria are other factors considered to be supportive of learning. The students said, "they would prefer science subjects to be taught with

experiments rather than just talking to us". Another group in the rural school stated that "they would prefer collaborative learning because one can get to hear other students' opinions, and you would have more help if you are stuck". Collaborative learning is advocated to achieve ESD objectives. "We copy things out from a book, and I had rather do stuff myself which is more interesting to me."

If students' rights are to be taken seriously, the need to create an environment in which all students regardless of their ability or need, are viewed and accepted as crucial players in decision-making about learning situations which best suit them.

6.3. Institutional practice: technical and economic aspects

Within this strand, the school needs to apply the principles and practice of sustainable development to its management and running of the school. The principles and practice exemplify the teachings given to the students about ESD in the formal curriculum or acquired through teaching and learning if we understand that sometimes formal teaching happens outside the classroom environment, for example, field trips. The choices that schools make, which are compatible with the aims and principles of sustainable development, where necessary should be made known to the students and advantages of using such measure to help them, therefore, make their sustainable development informed decisions in the future.

Key findings: - No recycling practise or policy

Clean energy not used

Inadequate infrastructure

Implications

School practices have a way of sending a message to the students. None of the case study schools had a proper waste disposal practice even with the knowledge of the effect of improper waste disposal to human health and the environment as seen in the curriculum (see appendix 2.1C). The basic science curriculum in JSS 1 indicates that students should be able to list ways in which refuse can be disposed of, they should also be able to distinguish between biodegradable and non-biodegradable materials. One of the teaching materials required for this topic is students visiting a refuse dump

sites, to see different types of refuse. In JSS 2 as a continuation of the topic, students are taught the consequences of indiscriminate disposal of refuse to the environment, and in JSS3, the curriculum shows that students should be taught the hazards as a result of not handling waste correctly. Now, the implication of not having a recycling practise or policy in place in schools is that the students are taught about proper waste disposal and the benefits of recycling, but do not see it applied in practice in their school. Lack of this practice undermines the credibility of what students learn. It is an example of the gap between the principle and practice of sustainability, and it means the 'whole school' curriculum does not address sustainability genuinely. During the focus group discussion in U2, one of the students said: "at home, we burn our waste, then the ones that cannot been burnt is buried in the ground or thrown at the backyard". Also, when asked, the consequences of his action to the environment, he does not know, this could be because he was still in JSS 1. However, if the school had a good practice in place, at least the student should have been able to gain that knowledge and transfer it to the parents. Assuming the student should leave school and continues this practice and some others do same, then it would be difficult for the ESD seen in the curricula content to contribute to national sustainable development. Consequently, Rivers State as a flood prone area does not need indiscriminate disposal of refuse or waste because the drainages, when blocked with refuse, cause flooding. The state also has environmental problems due to petroleum exploration, development and production operations. These activities have significant local, detrimental impacts on the atmosphere, soils and sediments, surface and groundwater, marine environment and terrestrial ecosystems in the State (Tawari-Fufeyin, Paul and Godleads, 2015). Another group in U1 said waste disposal has one of the things they dislike in their environment because refuse and domestic waste constitute a lousy sight in Rivers State. According to them, streets are littered with tons of garbage from animal to human carcasses. Though private sector waste disposal operators visit their homes and carry away refuse bags, and load them into trucks and cart them away for final disposal, the streets are still filled with waste. Research carried out by (Taiwo, 2009) on waste management issues in Nigeria revealed that wastes are being dumped into the lagoon and domestic disposal of waste militates against effective waste management to attain sustainable development in Nigeria. Data generated by Taiwo's study shows that the method adopted by people in disposing of waste is ineffective and falls short of international standards in waste management practices and

sustainable development. The ineffective waste management practices could be as a result of non-transformative learning acquired by the students in schools.

Another finding is that schools do not use clean energy. Power is supplied to the computer laboratories of U1 and U2 via a generating set. The fumes and sound from this generating set cause air and noise pollution. The basic science curriculum (see appendix 2.1F) indicates that students should be taught about pollution, various types of pollution, the causes and effects. When students are taught a topic in class, and they see the school doing a different thing, they cannot be convinced of what they have been taught in class. A pupil made this statement during one of the 1992 Summit,

"Coming here today, I have no hidden agenda. I am fighting for my future. At school, you teach us to behave in the world. You teach us not to fight with others, to work things out, to respect others, to clean up our mess, not to hurt other creatures, to share and not be greedy. Then why do you go out and do those things you teach us not to do?"

Severn Cullis-Suzuki, age 12, addressing the Rio Earth Summit, 1992, cited in Shallcross et al., (2006, p.29).

Therefore, the WSA strand of 'Institutional practice: technical and economic aspects' was not generally observed in the case-study schools. While elements of ESD are apparent in the written curriculum; these are not actioned in the institutional practices of the school. Institutional practice strand of the WSA is defeated because the goal of the framework is not achieved.

6.4. Monitoring and evaluation

Within the monitoring and evaluation strand, the school has the opportunity to assess the effectiveness of policy and measures carried out within the school. Monitoring and evaluation also create an opportunity to monitor the approaches to teaching and learning and knowledge acquired by the students. Monitoring and evaluation strand is the distinguishing feature of Shallcross' WSA model. Most importantly, this feature ensures that all measures put in place in the school in achieving sustainable development are as much as possible effective and relevant to the school context. As discussed in chapter 3, the five strands of WSA are interlinked, and a failure recorded

in one strand does affect other strands either overtly or covertly. Therefore, the need to continually monitor and evaluate the effectiveness of actions taken in the schools.

Key findings: - Evaluation or assessment is carried out through summative means only.

Poor record keeping was observed.

Implications: - As discussed in chapter two, ESD objectives is to link learning to real life experience. Therefore, it aims at promoting competencies like critical thinking, imagining future scenarios and collaboratively making decisions to enable the individual make an informed decision that lasts for a lifetime. During the fieldwork, it was evident that mode of assessment in the schools was through written in-class test or examination at the end of the term. In R2T2's words "our mode of assessment is only via written test. In fact, U2CR believes that the students were gaining knowledge, but there has not been a proper method of practically testing their knowledge. Assessment generally involves identifying appropriate standards and criteria and the making of judgements about quality. Assessment is also necessary to lifelong learning as it is to any formal knowledge experience even though it may not be represented in formal ways outside the environment of certification. Therefore, assessment needs to be seen as an indispensable aspect of lifelong learning (Longhurst et al., 2014). This implies that it has to move from the exclusive domain of assessors into the hands of learners. A focus on methods and techniques needs to be replaced by a new conception of sustainable assessment required for lifelong learning. Sustainable assessment encompasses the knowledge, skills and predispositions required to support lifelong learning activities. If assessment tasks within courses at any level does not support lifelong learning, then they cannot be regarded as contributing to sustainable assessment. Though assessment for certification purposes is reasonable, however, ensure that learning has influenced action and that students have become active lifelong learners, they also need to assess tasks (Mogensen and Schnack, 2010). This can be done in a way which identifies whether they have met whatever standards are appropriate for the task in hand and seek forms of feedback from their environment (for example peers) to enable them to undertake subsequent learning

more effectively. The students can do this in a wide range of settings and a variety of circumstances, according to (Moore, 2005). The outcome of this is that they will not be dependent on teachers or other formal sources of advice, but the students will be able to work with others and reciprocally deploy available expertise. According to (Tilbury and Janousek, 2006) a renewed focus needs to be placed on the role of formative assessment, to focus learner's attention on the processes of assessment and to permit them to learn how to make these processes their own, rather than ones they are subject to.

During the DESD, assessment at the secondary education level highlight the variability of student exposure to knowledge and engagement with various dimensions of sustainable development. Summative assessment has dominated thinking in educational institutions and public policy debates and has taken up too high a proportion of staff time, energy and resources at the expense of preparing active learners while formative assessment has been neglected (Longhurst et al., 2014). This suggests that there is need to introduce high-quality formative assessment practices because engagement with these practices will provide a secure foundation for lifelong learning and contributes directly to a learning society. Lifelong assessment is a necessary feature of lifelong learning for a learning society, which ESD portrays. It is only when we can view it informative terms that we can avoid assessment becoming a form of lifelong incarceration in which learners continually give over to others the power to judge and limit their actions

A study done in the province of Manitoba, Canada on the possibility of developing and deploying standardised measures for assessing changes in knowledge, attitudes and choices that might be correlated to investments in ESD, revealed an improvement across all measures of knowledge, attitude and choices. Another study by the International Civics and Citizenship Study (ICCS), sponsored by the International Association for the Evaluation of Educational Achievement (IEEA), found a positive correlation between citizenship education with the engagement of students in active citizenship across 38 countries in 2008 and 2009, (Michalos, Creech, Swayze, Kahlke, Buckler and, Rempel 2012).

On the other hand, effective management of the school requires a good record keeping according to Ololube (2013). This is to ensure that accurate and proper

records are kept of the students' achievement and growth, school activities and matters that will promote school efficiency. This implies that a plan-do-review routine in schools is encouraged. The school administration, according to Amanchukwu and Ololube (2015) was responsible for the storage of information of the school and proper record keeping encourages continuity. In the absence or retirement of any of the staff in the school, the activities carried out by such individual can be continued by the person that takes over. Shallcross et al., (2007) said that personal details of students, along with their academic performance; assessments and examination results, school policies, minutes of school-based meetings are data meant for record keeping and they are essential means of accountability because the records provide proof. It also helps school administration to make a decision. Records provide raw data that enable consistent, balanced and objective decisions on issues.

6.5. Community links

Community link encourages schools working closely with parents and the local community in creating sustainable development awareness. One of the strategies of Agenda 21 is creating public awareness as discussed in chapter 2. This strand encourages knowledge acquired in the formal curriculum, school culture and practices that support the aims and principles of sustainable development to be transferred to the local community. It also enables the school to infuse sustainability problems faced by the local community in their formal curriculum. In this way, the knowledge acquired from the classroom can help the local community in addressing environmental, economic and social challenges facing them.

Key findings – school leadership work closely with parents.

Schools do not get involved with the local community

Implications: During the interview with VR2, he said 'the school had a sensitising campaign in the local community to create awareness of the importance of education to the community' when they noticed that children of school age were not in school, rather going to farmland with their parents and some were seen hawking items. The result of the campaign was tremendous because parents started sending their children to school. This action implies that the aims of the federal government of Nigeria in

ensuring mass literacy as stated in paragraph 35 of the Education policy document is achieved. As well as, achieving one of the thrusts put in place by International Implementation Scheme (IIS) in promoting ESD as discussed in chapter two. The reason of reorienting education system to accommodate ESD was because, at all levels and areas of education, all citizens, young people and adults alike can learn how to contribute to the goals of a more equitable, environmentally sustainable and secure world (Shallcross et al., 2006). ESD calls for lifelong learning, which is the continual acquisition of knowledge and skills throughout someone's life. This implies that individuals' educational needs change over a lifetime. Lifelong learning involves, non-formal and informal ways of learning and occurs in preparation for and in response to the different roles, situations and environments that one will encounter in the course of a lifetime (Shallcross et al., 2006). ESD non-formal educational initiatives and resources targeting youth have been critical in raising awareness of sustainable development issues. This helps to empower youths to work with each other and with local communities. These types of non-formal initiatives are noteworthy in promoting change or action projects at the personal and community levels. Over the years, Non-formal education initiatives also provide an alternative pathway to learning and have helped to fill gaps in access to and quality of formal education systems. During the DESD, non-formal learning opportunities in natural environments that provide first-hand experience or exposure to nature had increased. Through teacher training and the involvement of local school children, The Lake Victoria Catchment Environmental Education Programme led by WWF aimed to empower catchment communities, schools and regional partners in sustainable use and the management of natural resources. The project promotes knowledge and skills among communities within the Lake Victoria catchment to make informed decisions on the management of their environment. As part of their daily educational activities, the programme has strengthened the capacity of teachers and teacher trainers in delivering environmental education. This includes the development of various environmental education materials. Raising awareness and understanding on the conservation of freshwater ecosystems, capacity-building on the topic of conservation for riparian communities and the creation of a partnership mechanism for environmental education (WWF, 2012).

The importance of the local context in public awareness initiatives had emerged in multiple cases during the decade of DESD. Policy-makers that attended the 2012 conference, the power of ESD: Exploring Evidence and Promise, held in Visby, Sweden, had identified ESD in local communities as one of the five significant thrusts of successful ESD at the national level (UNESCO, 2014). As a country, Australia has experienced the importance of local community awareness in the implementation of environment preservation and sustainability plans. Government departments and stakeholders deployed a range of approaches, including information sharing and awareness raising, material incentives in participation, community consultation, community capacity-building and community action (UNESCO, 2014)

In Okayama, Japan, an ESD was set up in 2005 to promote the implementation of ESD in the city through a multi-stakeholder process. Activities ranging from exposing the local public to the concepts and principles of sustainable development to encouraging implementation of sustainability was an ongoing process. All types of media including TV, radio, poster, flyer and promotional goods were used as promotion activity. The city held various events with cooperation from many local organisations such as Kominkans, citizens' groups and schools during the ESD week, which aimed at rallying people's interest in sustainable development and learn from each other through active participation in the events.

On the other hand, only in R2 did links with local community take place, other schools confirmed that due to funds and security, they do not carry out projects within the local community. This situation could hinder the local community from gaining knowledge of the impact of their actions to the environment and also hinder the implementation of WSA model in secondary education sector because the school structure does not support extracurricular activities. The effectiveness of this model is in putting knowledge into practice, as discussed in chapter 3 of this thesis. Sustainability cannot be achieved in isolation but instead requires individuals from across the school and the local community to work together. According to Mathar (2013), WSA pulls everyone involved in schools, local community inclusive, together to identify issues globally and locally, set priorities, plan solutions and put them into action. This implies that formal curriculum is integrated holistically in all areas of school systems and classroom knowledge as much as possible should reflect in schools' non-formal curriculum of daily practice. Since the campaign organised by R2 yielded results,

therefore, other campaigns could be organised by the school in sensitising local communities around them on environmental and social issues bothering them (as discussed in chapter one about Rivers State). Consequently, involving the parents of the students as said by PU2 and VU2 yielded a positive result; that means that this strand is essential in effectively achieving the sustainable development goals.

However, incorporating WSA model into the junior secondary schools in Rivers State might be challenging since basic structure to support the model are not presently in place at the schools.

Chapter Seven – Conclusion

7.0 Introduction

This chapter presents the conclusions drawn from the main findings of this study in response to the research questions and objectives of this study. This study sets to answer the following questions:

a. Does Education for Sustainable Development (ESD) in Nigerian secondary schools have potential to contribute to national sustainable development?

b. Could the Whole School Approach to ESD work in secondary education in Rivers State, Nigeria?

With the aim of:

a) Investigating the policy and practise of education for sustainable development in junior secondary education in Rivers State, Nigeria.

b) Reflecting on how appropriate the Whole School Approach (WSA) model for ESD is for junior secondary education in Rivers State

Conclusively, the study revealed three areas of ESD's potential contribution to national sustainable development, and these areas are policy, curriculum and practice. The education policy employed in Nigeria presently and curricula have a universalised educational philosophy and can positively contribute to sustainable development. Although, due to inadequate resources there was almost no evidence of ESD practices in the schools used for this study. Also revealed from the study is the non-appropriateness of WSA framework in junior secondary schools in Rivers State. While the Whole School Approach is a commendable model for raising awareness about sustainable development, it cannot be implemented presently in secondary school education due to some challenges. These challenges arise because the Whole School Approach assumes certain criteria from formal education, which Rivers State did not meet; such as inadequate funding, inadequate infrastructure and inadequate teachers' training. The state education board mostly manages the secondary education in Rivers State. Contrary to information provided online from the State website about the state of secondary education in Rivers State (see chapter one); My empirical study shows a gross difference. According to my findings, there is a difference between online

publication and the physical state of schools in Rivers State, (See appendix 3.1A) for evidence of the present state of government-owned schools in Rivers State). The state government strive to meet with the increasing demand of enrolling students into the state schools. This step is taken to meet up with the United Nations and the Federal Government mandate of ensuring free education for children up to school age. Also establishing more schools or subdividing existing ones but meanwhile little or no attention is paid to equipping and funding the schools.

In summary, empirical shreds of evidence from this study demonstrate that:

a) ESD is embedded in the published state curricula of junior secondary school education; however

b) There is a gap between what is written in the curricula and practice of ESD in the schools' teaching and learning

c) Teachers are not well informed about sustainability and the need to effectively put it into practice

d) Students find it difficult to relate classroom study to everyday life

e) Teachers do not feel satisfied with their condition of employment or service

f) The WSA model was found to have limited success in Rivers State.

This limitation should reflect in the reduction of the schools' ecological footprint, strengthening students' participation, improving the school-community relationship, encouraging professional development as well as have new strategies of monitoring and evaluating the process which was lacking in the schools used for this study.

The persistent minimal financial allocation and inadequate management of available resources in schools in Rivers state will continue to pose further constraint in as much as the state government continue to implement free secondary education policy with regards to annual enrolment.

7.1 Research Questions

RQ1 - Does ESD in Nigerian secondary schools have potential to contribute to national sustainable development?

Effective implementation of ESD theory and practice in junior secondary education in Rivers State has the potential to contribute to national sustainable development, because of the reasons discussed below;

Research method – Data used to answer this research question were retrieved through content analysis of Nigerian policy documents. Two documents were from the Nigerian Ministry of Education; the National policy on education and junior secondary education curricula. The National policy on education was analysed to get information on school planning and administration. The policy was put in place for teachers' qualification and how recruitment of teachers is done, teacher-student ratio and the provision of teaching aids. While the curricula were analysed to confirm the presence of sustainable development in the teaching materials used to teach the junior secondary schools in the state. These documents were prepared by the Nigerian Education and Research Development Council (NERDC) and used in all schools nationwide except that teachers are advised to apply each topic locally. Observation method help to gather data on implementation of the curricular content. This essence of the data is to further evaluate the performance of the teachers in teaching topics in the curriculum.

Findings – There are three potential ways ESD can contribute to national sustainable development, these areas are through education policy, curricula and practice.

7.1.1 Policy and curriculum

Universalised educational philosophy which is positive towards sustainable development. The curricula offer the potential to contribute to Nigeria's sustainable development positively in the following ways;

7.1.1.1 Limit to environmental degradation

A critical view of the curricula content holistically, indicates there is a high prospect of reducing air and water pollution presently afflicting the people in Rivers state. It was evident that the curricula have been reoriented to address ESD objective which would aid in Nigeria meeting the 2030 target of achieving Sustainable Development Goals (SDGs). The extensive discussion of this development took place in chapter five of this study: that there are pieces of evidence of cross-curricular mapping, independent styles of learning, children developing their critical points of view, being active in classroom, school and community and allowed to make a decision. Similarly, the seven fundamental concepts which underpin ESD are visible in these curricula and if followed diligently, will have the capacity to improve the quality of education in Nigeria, thereby helping in achieving healthy lives and promote well-being in the state due to the reduction in related environmental issues, and promote lifelong learning opportunities. It would also ensure the availability and sustainable management of water and sanitation, thereby making the state and human settlements inclusive, safe, resilient and sustainable. It will also reduce gas flaring and its impact on the environment and inform the students on how to conserve and manage resources appropriately effectively.

7.1.1.2 Economic improvement

Through sustainable agriculture and community improvement. The effective implementation of the curricula content gives the students the opportunity of lifelong learning that would result in economic improvement and reduce the unemployment rate. It results in finding a lasting solution to end hunger and poverty and geared towards achieving food security, improved nutrition and promote sustainable agriculture. This study would also help to empower the students and teachers in all forms by promoting inclusive and sustainable economic growth, providing full and productive employment and decent work for all, build resilient infrastructure and sustainable industrialisation, foster innovation.

7.1.1.3 Social justice and security

Both the curricula and policy content advocates for social justice and national security. The policy clearly states a good welfare package for the teachers and provision of infrastructural facilities in the schools and also promotes girls' education. This policy results in achieving gender equality and empower all women and girls, reduce inequality within and among countries, promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Subsequently, the curricula content can ensure that both present and future generation does not run out of natural resources and live in a safe and healthy environment because it covers the three pillars of sustainability on which the SDGs was built on.

7.1.2 Practice

There were little or no evidence of ESD practice in the schools used for this study and the reason for this conclusion is discussed below;

7.1.2.1 Leadership and management

Leadership in school is built on and refers to the ability to guide, inspire and motivate students and teachers. However, this was not evident in three out of the four schools used for the field work. Though this leadership ability is not innate, it can be promoted and developed through training, collaboration exchange between peers. The head teachers of the four schools used for this study clearly stated that the government do not provide them with adequate training to help them carry out their responsibilities properly and the head teachers have an enormous task in ensuring that their schools meet the education standard expected of them by the United Nations (UN). One of the head teachers admitted that her leadership skills were improved through personal training: she enrolled herself to help her better manage her school. In this situation of high expectations of developing countries educational provision, those leading schools have an enormous responsibility. Mulford (2003) has gone as far to conclude that,

“Effective school leaders are key to large-scale, sustainable education reform.” Therefore, with the present leadership and management method employed in these school, it would be difficult to effect changes in the schools.

7.1.2.2 School environment

Infrastructure

To sustain free quality secondary education depends largely on adequate provision of physical and material resources in the schools. School facilities are the material resources that support effective teaching and learning in schools. Such physical facilities include spacious and well-ventilated classrooms, adequately equipped laboratories and technical workshops; library stocked with books, common rooms, recreational ground, counselling rooms, staff offices and well-maintained toilets. The material resources such as furniture, laboratory materials (consumable and non-consumable), instructional tools, books and other stationery items as well as utilities such as electric power, and potable water in the schools, could enable teachers to achieve a level of effectiveness that exceeds what is possible when they are not provided. These infrastructural facilities were grossly inadequate in all the schools used for this study; the schools were lacking the basic materials, hence hindering the fulfilment of educational objectives. The presence/provision of adequate resources is necessary to the success of managing a school so that, teaching and learning can take place in a conducive environment.

Congestion in classrooms – The policy states clearly that a maximum of 40 students per class, however, from the fieldwork it was observed that each class accommodated not less than 80 students. Effective, teaching and learning may not have taken place in such congested classes, and this can affect the learning outcomes of the students.

Conclusively, Nigerian secondary education has the potential for ESD within its educational philosophy; but this is not operationalised in its practice as discussed above. There is a disconnect between policy, curricula and practice. Though the curricula and policy have excellent content regarding Nigerian secondary schools contributing to the national sustainable development, there is room for improvement

to ensure these curricula content and policy is put into practice. Some of the reasons this research can deduce for this disconnection between policy, curricula and practise are that there is no effective quality control system in place. Though government inspectors do come to schools occasionally to inspect their activities the reports made are not coherent to implemented. Themes emerging from the above research question was created from the three pillars of sustainable development on which the SGDs was built.

RQ2 - How effectively could Whole School Approach to education for sustainability be applied to junior secondary education in Rivers State, Nigeria?

WSA framework as discussed is a good model that has proven success stories in countries like England, Germany, Finland, South Africa and so on but its successful implementation in Nigerian schools is seen to be difficult because the countries that it has worked successfully has a certain level of educational facilities in place. In trying to answer the above research question, the following research methods were employed to gather empirical evidence. We considered the criteria for effective implementation of WSA as indicated section 3.2 of chapter three;

7.1.3 Curriculum and pedagogy

The curricula content fits into the SDGs that would lead to achieving sustainable development in Rivers state and has an adverse effect in the country as well, but pedagogy in place does not fit into the objectives of ESD if sustainable development is to be attained. It is because of the secondary schools used in the case study practice teacher-centred approach to teaching and learning which has limited relevance to effective ESD. The teachers were also not well informed about sustainable development; this is as a result of their level of qualification and professional development taking place. These teaching approach does have limits to transformative learning.

7.1.3.1 Teachers' Qualification

In the implementation of curriculum, teachers are seen as the most important force. Their efforts at providing quality education for students and raising student achievement cannot be underestimated. Teachers are the fulcrum on which the level of the educational system rests (Ige, 2014). Etim (2007) was of the view that the knowledge acquired by a teacher and how it is reflected the students is the most important influence on the knowledge gained by the students. Also, the Nigerian National Policy on education (2004) states that no educational system can rise above the quality of the teachers. Because of these, the recruiting and continuous professional development of teachers is central to the quality of service rendered by the teachers. Most importantly the quality of knowledge acquired by students to an extent is determined by their teachers. Teachers' qualifications, knowledge and skills, make more difference for student learning than any other factor (Ige, 2014). Most of the teachers interviewed were not very competent and also lacked motivation.

This study has revealed that most of the teachers were university graduates, but most do not have teacher training qualifications. It means that they are not trained in classroom management, curriculum development or pedagogy. Irregular payment of wages is also demoralising and demotivating.

7.1.3.2 Students' learning

Students find it difficult to relate classroom study to everyday life because there is a gap between curriculum content and teaching. Also evident is the inadequate provision of teaching aids such as charts, film/pictures, trips, specimen, and laboratory as indicated in the curriculum, is one of the most significant obstacles faced by schools (Ige, 2014). In places where ESD has been infused into the curriculum and taught well, these teaching aids were provided to bring the curriculum to life, for example in England. Closely allied to this is the fact that teachers need to be trained on how to draw out the goals and principles of sustainable development from the curriculum through fulfilling the objectives of ESD. Provision of teaching aids would enable teachers to use the most relevant and up to date materials, relevant to the content and be very useful in providing the broad and balanced education students need in a developing economy like Nigeria.

Though the curricula content is rich, the pedagogy has a vital role to play in ensuring that effective learning takes place in the life of the students. Education acquired in schools helps students make sense of the changes as well as fostering sustainability through lifelong learning. Therefore, the creation, acquisition, communication and wise use of knowledge are of particular importance to the society.

7.1.4 School culture and ethos

Culture is a distinctive way in which members of a school go about their work and relate to each other. It means that the culture of a school inevitably impacts on the learning of the students. The case study schools practised different culture, the impact of this on the students' outcome is that students from each school develop different values and attitude towards knowledge acquired in school. It can hinder the common goal of attaining a sustainable future if the students have different views of life.

7.1.5 School institutional practice

It has been established that the schools used for the case study do not practice what the curricula advocates. Therefore, this can affect the students' acceptance of knowledge acquired during classroom teaching. It simply means that there is no transformative learning taking place. The implication is that the value expressed in the curricula is of no essence to the nation since it cannot be translated to change individuals effectively.

7.1.6 Evaluation and monitoring

Evaluation and monitoring have to do with the process of reviewing and reflecting on activities carried out in the school to ascertain what has been done, and the impact and the lesson learnt during that process. Generally, it was observed that there was little evidence of evaluation of how effectively the learning had impacted on the values and attitudes of students. A meaningful strategy of evaluation is critical in achieving WSA because ESD processes are complex and dynamic. Therefore, evaluation mode

applied need to embrace this complexity as well as accept the controversial nature of dealing with development issues. Evaluation in WSA is not meant for quality control rather for quality enhancement where necessary. The schools employ a summative form of evaluation to determine the effectiveness of their teaching, this cannot ascertain the change in attitude, because the written test does not show the true sense of acceptance of the knowledge. If learning is to be improved to make on values and attitudes, then it will be necessary to address evaluation and monitoring of teaching practices.

7.1.7 Community links

Learning is no longer restricted to what goes on within the school walls. In countries where WSA has worked well, it is evident that schools relate well with their surrounding communities for effective change to be implemented. In societies that have been undergoing profound economic and social restructuring like Rivers state, the schools' role needs to be related directly to the changes that are taking place around it.

This study concludes that WSA is a good model for places where education/ community is well resourced but would be challenging to implement the model in a poor resourced educational environment. Therefore, WSA would be difficult to be implemented in Nigerian schools because the fives strands are interlinked, success or failure of one will affect the others. Subsequently, WSA as a model of ESD ensures that school attain quality education by being able to relate classroom study to daily activities and putting these activities into practice. Quality education results in possible achievement of the 17 SDGs because they are interconnected as discussed earlier in chapter two.

7.2 Contribution to the knowledge

My research makes valuable contributions to new knowledge in two main ways; By its empirical research into ESD in Nigerian secondary education; and secondly by evaluating WSA in the novel context of Nigerian secondary education. This thesis has contributed to greater understanding of sustainable development and the issues that leads to sustainable development being interpreted in different ways. In chapter 2, this

thesis tried to bring out the transformative role of education in achieving the sustainable development goals. Most research work on sustainable development in Nigeria has been on the environmental impact of some unsustainable activities carried out in the country. Meanwhile, research on ESD in Nigeria before now bases on desk methods. The findings of this study have been based on empirical evidence gathered from fieldwork using four schools in Rivers State by critically evaluating the effectiveness of the curriculum against actual classroom teaching. These findings helped to find out the information and communication gap between theory and practise and factors hindering sustainable development in Nigeria.

This research will benefit the Nigerian Ministry of Education, head teachers, students and local authorities and in ESD more widely.

7.3 Limitations of research

This study was limited by time and security available. A second filed work was needed to ensure that data gathered at the first attempt corresponds to the second fieldwork. This is due to the transition of political power in the state, and it is possible that the participants may have experienced further transformation in schools' environments, improvement in the welfare of the teachers and efficient quality control mechanism. However, due to security issues in the state, it was difficult for a second visit to happen.

Another perceived limitation is the method used, with qualitative research there is a risk of an individual's opinions strongly coming across others and might skew the analysis. Some of the participants interviewed, showed a very negative view of the government as the cause of their incompetence, while, others feel personal development would have been an option to develop oneself. It is, therefore, necessary to balance all views and take a holistic approach to the analysis of data gathered.

Also, a smaller than desired sample size is a frequent limitation in any case study research, and this research is no exception. The data was collected from four schools out of 243 secondary schools in the state; this might not be well represented.

7.4 Reflexivity

This section directly refers to the relationship between the researcher and the research work conducted as argued by Brannick and Coghlan, 2007). Reflexivity, in this case, implies the researcher is not left out as she is the protagonist from the commencement to the completion of the project. Ryan and Golden (2006), stipulates that any step to segregate the researcher and the institutions from the research process especially with research consisting of qualitative data is pathetic. However, increasing development of computer software to analyse qualitative data are gradually eroding that relationship argued by Ryan and Golden, (2006).

In this section the role of the research is considered under the following reflexivity;

- Epistemological position
- Personal reflexivity.

The philosophical underpinning of the research question leads to the adoption of the interpretive approach as I noticed that ontological truth could not be easily revealed without my experience together with other social-cultural phenomena. Crotty (1998) supports my position by arguing that truth about a phenomenon is revealed through researcher and participant's interactions.

In this study, I employed a qualitative case study approach based on an interpretive paradigm to gain profound insights about the appropriateness of WSA model in Rivers State secondary school education. More importantly, WSA as a model has been employed in Europe, Germany, Australia, South Africa and other countries in achieving eco-friendly schools and training individuals in attaining sustainable lifestyle. Because of this, I tried to confirm the effectiveness of this model in the Nigerian context. In so doing, four research methods were employed; they are documented analysis, semi-structured interview, observation and focus group discussion. These methods helped to provide data that was used to draw the conclusion provided in this research.

I set out to study how effective a model of education for sustainable development called 'Whole School Approach' to sustainability can be implemented in junior secondary school education of Rivers State, Nigeria. Having considered some academic journal and seen the effectiveness of WSA model in European schools and

other developed countries, I assumed that implementing such model that integrates a whole school system would be a good idea in the Nigerian context.

I had assumed at the beginning that the WSA model would fit into Rivers State secondary school education because the information retrieved from the state's website painted a rich picture of the government-owned schools in Rivers State. Reflecting on the outcomes of this research and my personal experience, which gives credence to my interpretive stance. In the light of a cross-cultural study, the different Interpretations that the same model has in different places at different times were most remarkable. For instance, educational priorities are viewed entirely different in two cultures. The revenue allocated to the education sector in Nigeria is far less than the UN recommended allocation, and this is believed to have a gross effect on the education sector.

I want to reflect on my role as a researcher in the research process. As a Nigerian citizen and so very conversant with the structures in the Nigerian public sector, I had to go through the state education board to gain access to the schools used in my study. Reflecting on the interviews, I can conclude that some participants took advantage of the research to voice out their frustration concerning how dissatisfied their job is.

It has been a long journey, and I can see how I started without a clear guide and not knowing my ontological position, but now, as a result of this research work I can confidently see myself in the stream of an interpretive researcher.

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Appendices

Appendix I: Participant Information Sheet

University of Huddersfield

School of Education and Professional Development

Participant Information Sheet

Research Project Title: An exploration of the potential for Nigerian secondary schools to contribute to national sustainable development through the provision of education for sustainable development (ESD).

You are being invited to take part in a study for my PhD research. Before you decide it is important for you to understand why this research is being done and what it will involve. Please take time to read the following information and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. May I take this opportunity to thank you for taking time to read this.

What is the purpose of the project?

The study is intended to provide the research focus for my Major Study which forms part of my PhD degree. It will attempt to test the appropriateness of an education for sustainable development model called whole school approach in Rivers State secondary school education context.

Why have I been chosen? You have chosen to take part in this study because you teach one of the subjects selected for this study.

Do I have to take part?

Participation on this study is entirely voluntary, so please do not feel obliged to take part. Refusal will involve no penalty whatsoever and you may withdraw from the study at any stage without giving an explanation to the researcher.

What do I have to do?

You will be invited to take part in a face-to-face interview. This should take no more than 50 minutes of your time.

Are there any disadvantages to taking part?

There should be no foreseeable disadvantages to your participation. If you are unhappy or have further questions at any stage in the process, please address your concerns initially to the researcher if this is appropriate. Alternatively, please contact Dr Mrs Efebo of the state education board.

Will all my details be kept confidential?

All information which is collected will be strictly confidential and anonymised before the data is presented in my Major Study, in compliance with the Data Protection Act and ethical research guidelines and principles.

What will happen to the results of the research study?

The results of this research will be written up in my Major Study and presented for assessment in **March, 2017**. If you would like a copy please contact the researcher.

Who has reviewed and approved the study, and who can be contacted for further information?

The research supervisor is Emma Salter. They can be contacted at the University of Huddersfield. Alternatively, Dr Mrs Efebo of the State education board can be contacted.

Name & Contact Details of Researcher: Ugonwa Aroh, U11690

Appendix 11: Participant Consent Form

University of Huddersfield

School of Education and Professional Development

Participant Consent Form

Title of Research Study: An exploration of the potential for Nigerian secondary schools to contribute to national sustainable development through the provision of education for sustainable development (ESD).

Name of Researcher: Ugonwa Aroh

- ☐ I confirm that I have read and understood the participant Information sheet related to this research, and have had the opportunity to ask questions.
- ☐ I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.
- ☐ I understand that all my responses will be anonymised.
- ☐ I give permission for members of the research team to have access to my anonymised responses.
- ☐ I agree to take part in the above study

Name of Participant: ……

Signature of Participant: ……

Date: ……

Name of Researcher: Ugonwa Aroh

Signature of Researcher:

Date:

Appendix III: Interview Questions

Do you have an idea of the concept of ‘sustainable development’ and ‘education for sustainable development’?

- If ‘yes’:

a) How did you get to know about the concepts?
b) Could you relate the meaning, implication and anything else about the two concepts?
c) What issues or topics come to your mind first when you hear about the concepts?
d) Do you think the knowledge got from pre-service training is sufficient to help you teach the students – especially in giving practical example or relating curriculum content to their everyday living?
e) Do you use issues of the immediate community as an example during teaching, if yes do you offer practical solutions to the issues observed?
f) How do you ascertain that what you taught was actually understood by the students?
g) Do you experience any difficulties in understanding the concept of SD?

Appendix IV: Focus Group Questions

- Draw a picture of your environment either home or school.
- What informed you to draw the features in the picture?
- Does the knowledge acquired during your secondary education reflect this in terms of problems, causes and solutions?
- Please discuss the method of learning used in your school, did you get the opportunity to explore what you have learnt within the school?
- Are you represented in decision making?
- Do you know how materials used in your school are resourced and what happens after they are been used?
- Is there a relationship between your school and the local community?

Appendix IV: Observation Guide

The physical environment

The school environment – the location, school culture, building

The arrangement of classroom

Number of students in the class

Teaching method employed

Relationship between the teacher and the students

Teaching content and process

In what way does the teacher integrate sustainable development into the curriculum?

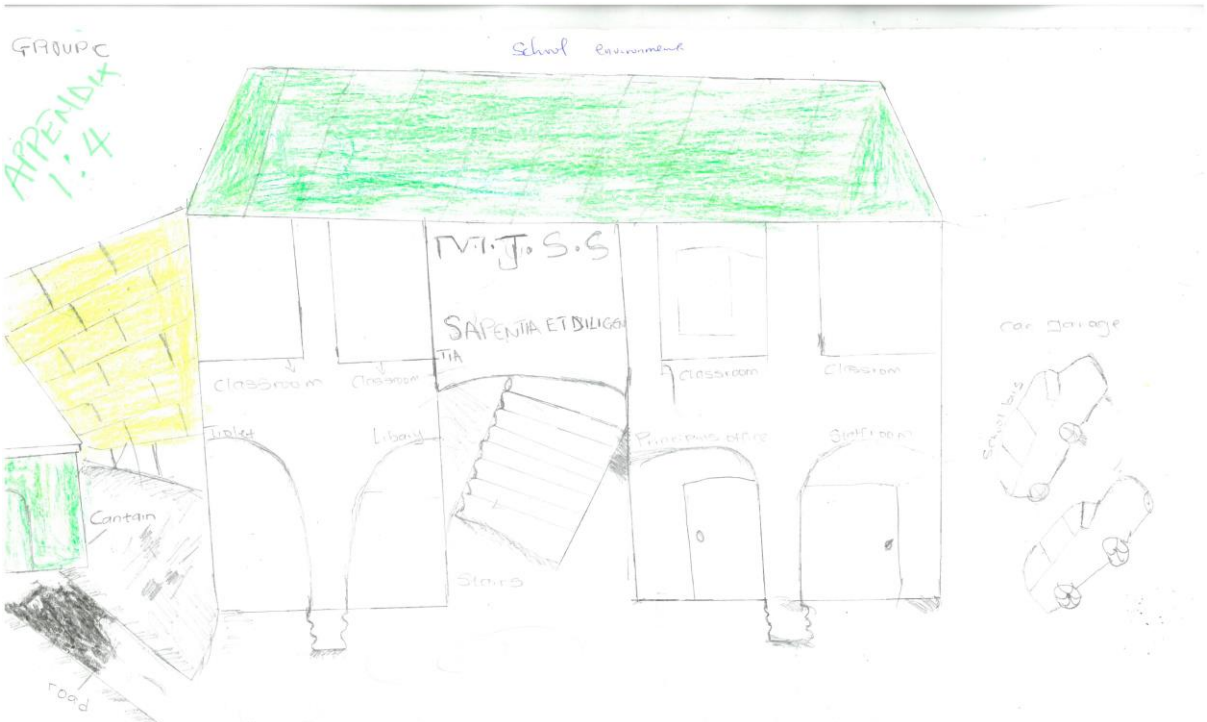
Check the students engage in the class and task given to them

Communication between the students

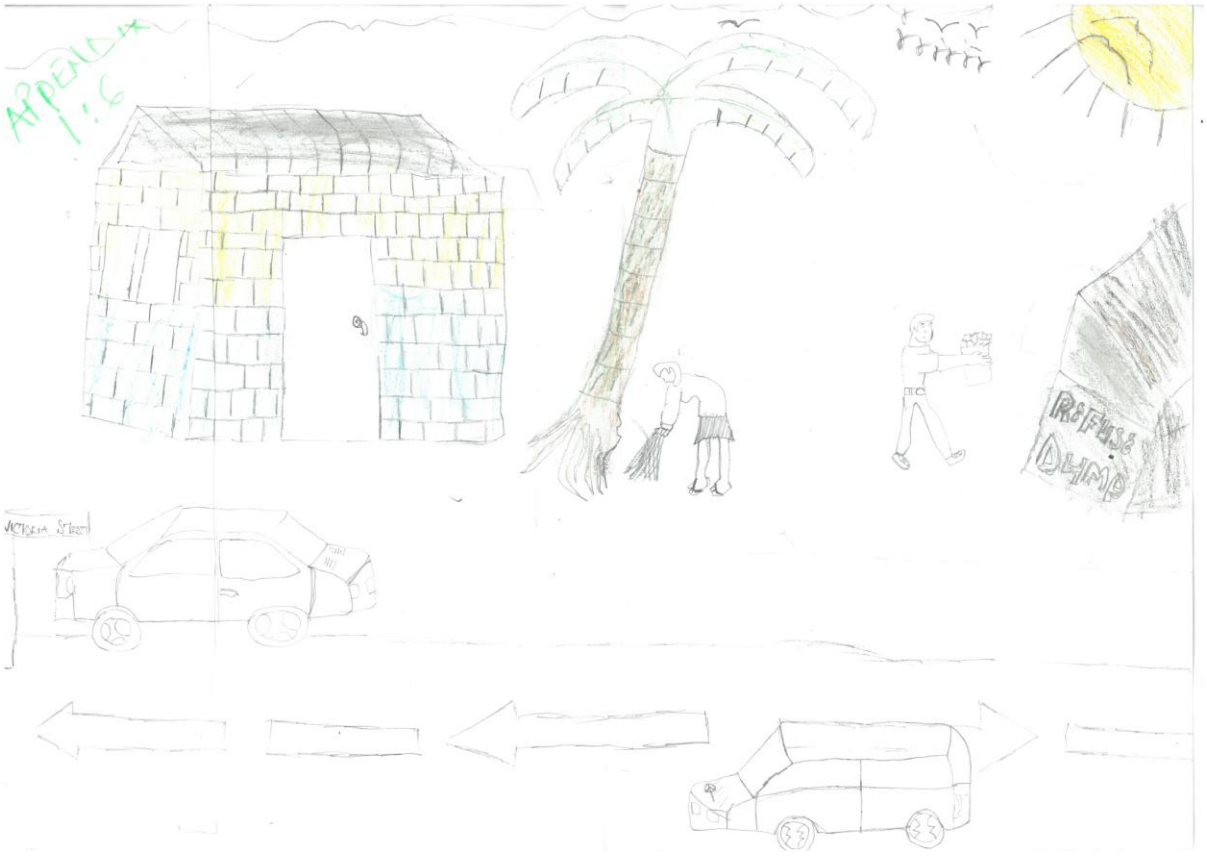
Appendix 1 (Rich pictures produced during focus group)

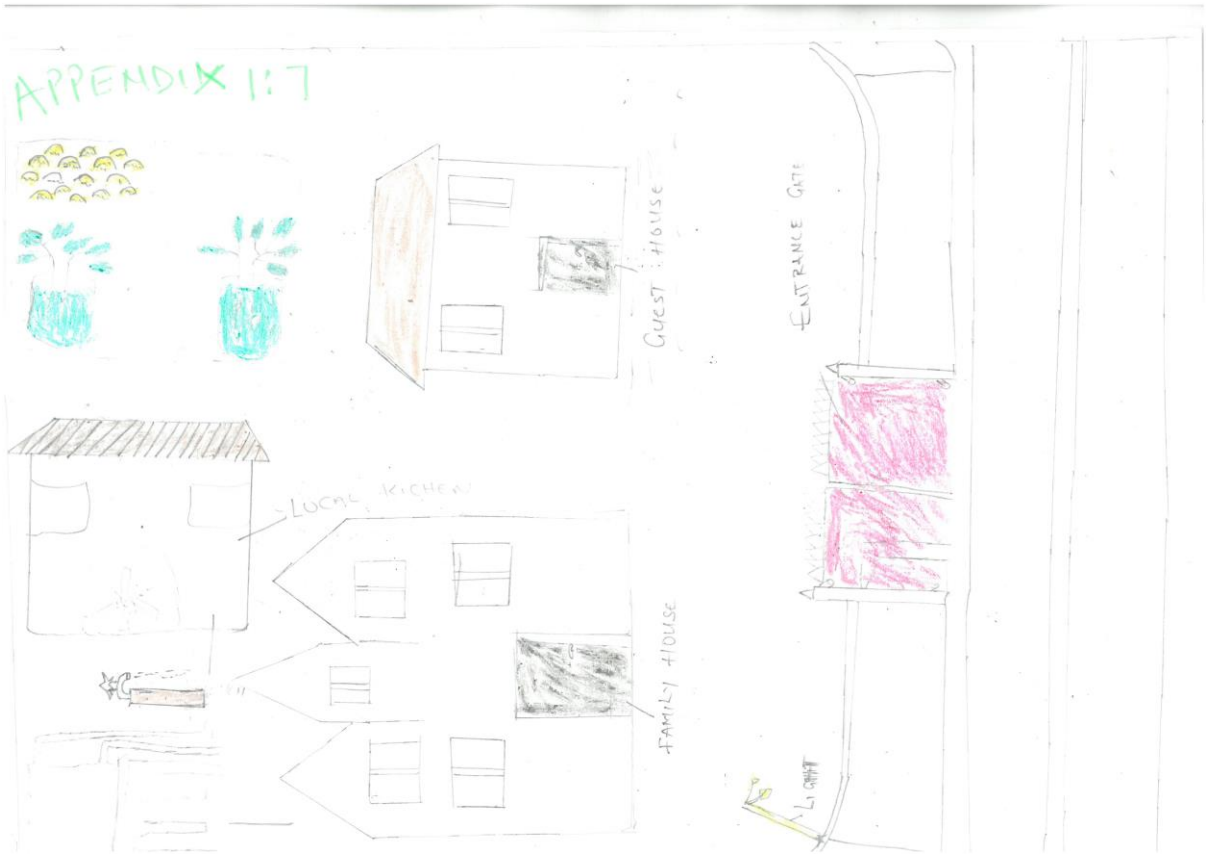

APPENDIX 1:2
GROUP - A OF J.S.S. EMOHUA
Football Field


APPENDIX 1:3
Toilet
Gate
ENVIRONMENT


GROUP C
APPENDIX 1:4
School environment
M.I.J.S.S
SAPIENTIA ET DILIGE
TIA
classroom
classroom
classroom
classroom
toilet
Library
Staff room
Canteen
Stairs
road
car garage


APPENDIX 1:5
GROUP B G.S.S Emohua


APPENDIX
1:6
REFUSE
DUMP


APPENDIX 1:7
GUEST HOUSE
ENTRANCE GATE
LOCAL KICHEN
FAMILY HOUSE
LIGHT

Appendix 2.1A – 2.1K (Basic Science for Junior Secondary School).

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2·1A JS ONE

THEME 1: YOU AND ENVIRONMENT

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS	EVALUATION GUIDE
			TEACHER	STUDENTS		
1. Family Health (Cleanliness)	Students should be able to: 1. define personal cleanliness; 2. describe the methods of keeping their bodies and homes clean; 3. list advantages of personal cleanliness 4. explain the consequences of poor hygiene.	Personal Cleanliness: — meaning — methods — advantages/ disadvantages	1. Guides learner to define personal cleanliness 2. Leads discussion on: — methods of keeping bodies and homes clean. — maintenance of personal cleanliness: — advantages of personal cleanliness. — disadvantages of poor hygiene	1. Bring samples of toiletries/cleaning agents to the class. 2. Participate in class discussions. 3. Copy chalkboard summary. 4. Observe personal hygiene in the class and home.	1. Toiletries 2. Cleaning agents 3. Charts 4. Posters	Students to: 1. define personal hygiene 2. list 3 methods of keeping their bodies and homes clean 3. name six cleaning agents 4. state four consequences of poor hygiene. 5. state three advantages of personal cleanliness
2. Family Health (Nutrition)	Students should be able to: 1. identify food types; 2. group food into classes based on nutrient content; 3. explain the meaning of adequate diet; 4. plan an adequate diet for a home.	Food and adequate diet: - type/Composition - adequate diet.	1. Leads students to identify food types, food nutrients and classes. 2. Guides students to group foods into classes based on nutrient content. 3. Guides class discussion on adequate diet and planning an adequate diet for a home.	1. Bring food items from home 2. Participate in class discussion. 3. Sort foods into classes. 4. Prepare adequate diet for home.	1. Food items 2. Charts 3. Posters	Students to: 1. list food types 2. classify foods based on nutrient content 3. define adequate diet 4. produce adequate diet chart.

2·1B

THEME 1: YOU AND ENVIRONMENT — **JS ONE**

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS
			TEACHER	STUDENTS	
2. Environmental Conservation and Safety I (Maintaining Balance)	Students should be able to: 1. state the source of the earth energy; 2. explain water, carbon and nitrogen cycles; 3. explain the conservation of energy, water and wildlife; 4. discuss the importance of maintaining balance of resources in the environment.	1. Sun as source of earths energy. 2. Sun's energy captured by plants, eaten by animals, reverted to earth in form of elements. 3. Carbon, water and nitrogen cycles. 4. Conservation of energy, water and wildlife.	1. Guides students to identify the sun as the source of earth's energy. 2. Uses chart to show energy flow. 3. Uses charts to illustrate the natural cycles. 4. Leads discussion on the importance of conservation of natural resources. 5. Organizes field trip/excursion.	1. Participate actively in discussions. 2. Observe and study the charts on energy flow and natural cycles 3. Go on a nature visit/Field trips/excursion.	1. Charts 2. Film/pictures of wildlife

2:1C

THEME 1: YOU AND ENVIRONMENT — **JS ONE**

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING & LEARNINGS MATERIALS
			TEACHER	STUDENTS	
3. Environmental Conservation and Safety II (Sanitation)	Students should be able to: 1. identify the various types of human activities that affect environmental balance; 2. list ways in which a community/school can dispose refuse; 3. distinguish between biodegradable and non-biodegradable materials 4. explain the need for environmental sanitation:	1. Types of human activities e.g. farming, sewage/refuse disposal, construction, transportation, industrialization, etc. 2. Effect of human activities on the ecosystem. 3. Biodegradable and non-biodegradable materials. 4. The compost 5. Benefits of environmental sanitation.	1. Guides discussion on human activities and their effects on the environment. 2. Leads the students to collect biodegradable and non-biodegradable materials from the school compound. 3. Initiates activities leading to compost making	1. Participate in discussions. 2. Collect refuse and classify into biodegradable and non-biodegradable. 3. Visit refuse dump sites and record observation for class discussion. 4. Make compost	1. Pictures 2. Films 3. Refuse dump sites 4. Garden implements 5. Water.

2:1D

JS ONE

THEME 4: YOU AND ENERGY

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES	
			TEACHER	STUDENTS
1. Energy	Students should be able to: 1. explain the meaning of energy; 2. state and describe the source of energy 3. name forms of energy; 4. explain how energy is transferred from one form to another; 5. state the uses of energy	1. Meaning of energy. 2. Sources of energy 3. Forms of energy 4. Transfer of energy 5. Uses of energy	1. Initiates discussion. 2. Leads students to mention sources of energy. 3. Provides some materials for activities to illustrate forms of energy. 4. Uses the activities in (3) to illustrate transfer. 5. Provides charts on uses of energy for discussion	1. Participate in discussion. 2. Mention sources of energy. 3. Carry out activities on energy 4. Describe the actions as indicated on the chart
2. Renewable and Non-Renewable Energy	Student should be able to: 1. explain the meanings of renewable and non-renewable energy; 2. give examples of renewable and Non-renewable energy; 3. state the implications of misuse of non-renewable energy;	1. Renewable and non-renewable energy. - meaning - examples - use and misuse	1. Initiates and leads discussion on renewable and non-renewable energy. 2. Leads the discussion to identify renewable and non-renewable energy. 3. Leads discussion on conservation of crude oil, felling most of the trees in the forest, overloading the hydroelectric power stations tc.	1. Participate in the discussion. 2. Identify renewable and non-renewable energy. 3. Participate in the discussion and note the main ideas.

2:1E

JS TWO

THEME 1: YOU AND ENVIRONMENT

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS	EVALUATION GUIDE
			TEACHER	STUDENTS		
1. Family Health (diseases)	Students should be able to: 1. identify types of diseases; 2. describe the different modes of transfer of diseases; 3. mention disease vectors; 4. list ways of preventing diseases; 5. analyse the consequences of contracting diseases or infections.	1. Diseases: - Types - Modes of transfer 2. Disease vectors 3. Disease prevention: - sanitation - education - immunization - choice of life partners, etc 4. Consequences of contracting diseases on: - family - individual - society.	1. Brings posters/pictures of diseased persons to the class. 2. Guides class discussion. 3. Invites guest speakers to talk to students about - disease types; - mode of contracting infection - disease vectors; - preventive method	1. Participate in class discussion and listen to guest lecture. 2. Ask and answer questions. 3. Take notes	1. Posters 2. Pictures 3. Films strips 4. Video clip 5. Films	Students to: 1. list five types of disease 2. state their causes and mode of transmission 3. identify 3 disease vector 4. mention 3 ways of preventing diseases 5. list four consequences of contracting disease/ infections

2:1F

JS TWO

THEME 1: YOU AND ENVIRONMENT

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS	EVALUATION GUIDE
			TEACHER	STUDENTS		
2. Environmental Pollution: i. Water	Students should be able to: 1. define water pollution. 2. identify water pollutants and their effects. 3. list causes of water pollution; 4. mention ways of reducing the risk of water pollution. 5. describe how water pollution can be controlled	1. Definition of environmental and waterpollution 2. causes of water pollution: - domestic/industrial waste - fertilizer insecticide etc - oil spillage 3. Consequences of water pollution. 4. Control measures.	1. Leads discussion on water pollution 2. Organizes a visit to a site of polluted water. 3. Using charts, leads discussion on different problems of water pollution and their solutions. 4. Guides activity on water boiling and filtration. 5. Leads discussion on pollution control	1. Participate in discussions 2. Visit an identified site 3. Write down chalkboard summary 4. Carry out activity on water boiling and filtration.	1. Charts on water filtration 2. Utensils and materials for filtration - Bucket - Funnel - Stove - Pot - Filter paper - sieve etc.	Students to: 1. define water pollution 2. name 3 examples of wate pollutants. 3. state 3 major causes of water pollution ir the community. 4. briefly explain the consequences of water pollution t the environment and man. 5. write a report on the fiel visit to a pollutec water site

THEME 1: YOU AND ENVIRONMENT 2:1G **JS TWO**

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS
			TEACHER	STUDENTS	
ii. Air pollution	Students should be able to: 1. define air pollution. 2. list some air pollutants 3. identify sources of air pollution. 4. discuss the effects of air pollution 5. discuss the different methods of pollution control.	1. Definition of air pollution 2. Sources of air pollution 3. Consequences of air pollution. 4. Control measure	1. Leads discussion on air pollution and its effects. 2. Arranges a class visit to a nearby factory/industry. 3. Uses charts, films and pictures to guide class on the consequences and control measures.	1. Participate in discussions. 2. Visit a factory and take notes. 3. Watch films and pictures on air pollution.	1. Films 2. Charts 3. Pictures on pollution
iii. Soil pollution	students should be able to: 1. define soil pollution 2. list soil pollutants 3. Discuss the effect of soil pollution. 4. Suggest how soil pollution can be controlled.	1. Definition of soil pollution 2. Types of soil pollutants; - agricultural - chemical - Non-biodegradable materials. 3. Effect of soil pollution e.g. kill soil organisms, reduce nutrient values, poor plant yield; 4. Control measures: recycling of non-biodegradable materials.	1. Leads discussion on soil pollution and general effects of soil pollution. 2. Organizes visit to site of polluted soil. 3. Brings polluted soil sample and illustrates its effect on life (plants and animals)	1. Participate in discussions 2. Take record of soil pollutants from visit of site. 3. Observe polluted soil sample and take notes	1. Film 2. Pictures of polluted land. 3. Polluted soil sample

THEME 1: YOU AND ENVIRONMENT **JS THREE** 2:1H

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS	EVALUAT GUIDE
			TEACHER	STUDENTS		
2. Environmental Hazards i) Soil Erosion	Students should be able to: 1. explain soil erosion; 2. identify human activities that cause erosion. 3. describe methods of controlling erosion; 4. describe practical methods of preventing erosion on a given farm-land	1. Definition of soil erosion 2. Causes of soil erosion 3. Control soil erosion	1. Leads discussion on erosion and its effects 2. Demonstrates erosion on a sloppy ground by allowing water to run through; 3. Leads a visit to a nearby erosion site and guide students to suggest measures of control	1. Participate in discussion and demonstration of erosion 2. Visit erosion site.	1. Water. 2. Watering can 3. Sand	Students to 1. define ero 2. explain 2 activities c man that promote erosion. 3. describe tv methods o controlling erosion 4. explain hov soil erosion can be prevented.
ii) Flooding	Students should be able to: 1. describe different types of drainage patterns in their community, 2. state the causes of flooding; 3. describe how	1. Drainage patterns. 2. Causes of flooding 3. Prevention of flooding. 4. Effects of flooding on community and farm land.	1. Lead students to observe the different drainage patterns around the community	1. Participate in class discussions. 2. Visit drainage sites and write down their observation.	1. Pictures 2. Film	Students to: 1.identify two common ty of drainage pattern. 2.state two causes of flooding in

JS THREE

THEME 1: YOU AND ENVIRONMENT

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING& LEARNINGS MATERIALS	EVALUATION GUIDE
			TEACHER	STUDENTS		
v) Desertification	Students should be able to: 1. define desertification and its effects; 2. identify geographical zones prone to desertification 3. describe different human practices that lead to desertification 4. identify various methods for the control of desertification	Desertification: 1. Definition 2. Geographical area 3. Causes – overgrazing, bush burning, cutting trees for firewood, etc. 4. Control.	1. Leads discussion and use maps of Nigeria to show areas that are prone to desertification 2. Encourage students to participate in community effort to curb desertification.	1. Participate in discussion 2. Participate in tree planting.	1. Charts 2. Pictures 3. Tree seedlings 4. Films	Students to: 1. define desertification: 2. escribe the effects of desertification on the environment; 3. discuss three human practices that promote desertification; 4. list four methods of control of desertification.
vi) Depletion of Ozone Layer and its Effects	Students should be able to: 1. identify where ozone layer is located in the atmosphere: 2. state the importance of ozone layer; 3. state the hazard of depletion of ozone layer to life on earth; 4. mention control measures against depletion	1. Description of the Ozone layer and it location in the atmosphere 2. Importance of Ozone layer 3. Effect of depletion of Ozone layer - global warming - green house effect - ice melting and flooding 4. Control measure - Regulation on use of chlorofluorocarbon (CFC), reduce bush burning, and control burning in house hold activities.	1. Using newspaper clippings, films and pictures lead discussion on importance and consequences of Ozone layer depletion. 2. Guides students to identify and list sources of CFCs.	1. Participate in discussion 2. Observe films and pictures 3. Identify and list sources of CFCs.	1. Films 2. Pictures 3. Newspaper clippings	Students to: 1. state the location of Ozone layer in the atmosphere. 2. mention the importance of the ozone layer; 3. mention three hazards of depletion of ozone layer to the environment; 4. state two control measures for reducing the rate of depletion of the Ozone layer.

JS THREE

THEME 3: SCIENCE AND DEVELOPMENT

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING & LEARNINGS MATERIALS	EVALU GU
			TEACHER	STUDENTS		
1. Skill Acquisition	Students should be able to: 1. explain the meaning of skill and skill acquisition; 2. state reasons for acquiring skills 3. state the importance of skills acquisition. 4. list types of skills	1. Meaning of skill Acquisition 2. Reasons for skill acquisition; d. taking risks e. decision making f. managing emergency situation g. survival strategy h. learning to live together 3. Types of skills i. farming j. basic computer literacy k. photography l. internet m. internet browsing, e-mail operation n. fax o. desktop publishing and networking, etc 4. importance of : - skill acquisition, - improve quality of life; appreciate human capability.	1. Leads class discussions on: meaning, reasons for, importance and types of skill acquisition 2. Leads visits to different types of professionals e.g. fine artists, mechanics, tailors, pottery makers, etc. 3. Invites resource person.	1. Participate in discussion. 2. Taking part in the visits 3. Listen to resource person and ask questions.	Relevant charts, pictures, films and diagrams.	Studen 1. ex ski ski ac 2. giv rea wh ne ac ski 3. list ty sk 4. sta it im to sk
2. Ethical issues in Science, and Development	Students should be able to: 1. express their views on right and wrong application of science 2. discuss the implications of the application of science to the development of the society	1. Meaning of right and wrong application of science 2. Implications p. destroys individuals life; q. Adverse effects on a country.	1. Guides class discussion on topical issues in the application of science to human development. 2. Groups students and guide them to choose topics on good and bad scientific practices.	1. Participate in class discussions 2. Carry out projects 3. Write and report on projects.	1. Reference books 2. Pictures 3. Newspapers 4. Magazine clippings.	Stude 1. lis exam of goo bad s practi 2. gi reaso each abov 3. s grou repo asse

Appendix 2.2A - 2.2A (Basic Technology for Junior Secondary School)

2:2A

JS ONE

THEME 1: YOU AND TECHNOLOGY

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS	E G
			TEACHER	STUDENTS		
(a) Concept of Technology	Students should be able to: 1. define what technology is and it's benefits; 2. identify the products of technology; 3. discuss how technology has contributed to human living.	1. Concept of technology: definition, and benefits. 2. Products of technology. 3. Life application of technology.	1. Defines and illustrate the meaning of technology. 2. Gives brief historical development of technology (including local examples). 3. Shows pictures of technological processes and products.	1. Listen attentively, ask and answer questions. 2. Identify elements of technology in the environment.	1. Drawings and pictures of technological products and processes. 2. Films, video cassettes, and slides of technological processes.	S 1. 2. o s 3. te
(b) Technology and Society	Students should be able to: 1. describe concrete ways in which technology has improved standards of living.	Products of technology: cutlery, houses, motor cars, computers, lighting system, etc.	Explains products of technology.	Listen attentively, ask and answer questions.	Pictures of technology products.	S li p fo a
(c). Who should study Technology?	Student should be able to: realize that technology is for all: both boys and girls, young and old.	Need for technological literacy and capability for all as life coping skill.	1. Explains that technology is universal. 2. Illustrates that both males and females should study technology.	1. Participate in class discussion. 2. Cite role models of males and females in technology.	Pictures of males and females working in industries.	S 1 e s t 2 r t l

2:2B

JS ONE

THEME 3: MATERIALS AND PROCESSING

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS
			TEACHER	STUDENTS	
Properties of Materials	Students should be able to: 1. identify, classify and describe the properties of wood; 2. identify, classify and describe the properties of metals; 3. identify the properties of ceramics and glass.	1. Wood: i. identification by colour: mahogany, afara, obeche, opepe, mansonia, etc. ii. classification: hardwood and softwood. iii. properties e.g. Hardwood, has broad leaves, seed enclosed in seed cases. Softwood, has needle like leaves, naked seeds. 2. Metals: i. Identification by their physical properties, e.g. lustre, density, sound, malleability, ductility, etc. ii. classification: ferrous and non-ferrous with examples. iii. forms: e.g. rods, bars, pipes, wires, plates, sheet, etc. 3. Ceramics and glass i. types: bricks, tiles bottles, cups, pots, etc. ii. properties: brittle, heat resistant, etc.	1. Displays specimens of various wood types. 2. Name, labels, classifies and describes the properties of wood. 3.Displays specimens of various metals. 4. Emphasizes recognition of metals. 5. Stresses specific use of ferrous and non-ferrous metals. 6. Displays glass and ceramic products and describes their properties. 7. Emphasizes how properties determine usage.	Students, individually or in groups: 1. examine specimens of wood. 2. visit a timber yard or shed. 3. carryout simple tests to differentiate hard wood from soft wood. 4. examine specimens of metals. 5. undertake field trips to wood and metal industries. 6. examine various types of ceramics and glass.	1. Specimens of various types of wood and metal. 2. Various types of ceramic and glass products.

2:2C

JS ONE

THEME 6: ENERGY AND POWER

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS
			TEACHER	STUDENTS	
Concept of Energy and Power	Students should be able to: 1. define the concept of energy and power; 2. state units of energy and power.	1. Concept of power and energy. 2. Definitions: i. power ii. energy. iii.units 3. Relationship between energy and power.	1. Explain the concept of energy and power. 2. Demonstrate how energy is expended in different ways.	State various ways in which energy is used.	Fan, battery, regulators, electric bulbs, bicycles.

2:2D

JS ONE

HEME 9: MAINTENANCE

OPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS	EVALUATION GUIDE
			TEACHER STUDENTS			
ncept of intenance	Students should be able to: 1. explain the importance of maintenance; 2. list and describe types of maintenance practices.	1. Need for maintenance. 2. Types of maintenance: i. preventive, ii. corrective iii.predictive.	1. Explains the need and importance of maintenance. 2. Explains types of maintenance. 3. Emphasizes the need for regular maintenance.	1. Listen attentively. 2. Undertake simple maintenance: regular cleaning, oiling and greasing of simple machines and furniture.	Grease, engine oil, louver frame, tools and machine parts, cotton, rag, etc.	Students to: 1. explain the importance of maintenance; 2. list and explain types of maintenance.

2:2E

JS TWO

THEME 2: SAFETY

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS	EVALUATION GUIDE
			TEACHER	STUDENTS		
First Aid and First Aid Materials	Students should be able to: 1.define first aid; 2. list first aid materials; 3. apply first aid measures.	1. First aid box and materials. 2. Application of simple first aid.	1. Exhibits and explains first aid materials and their uses. 2. Demonstrates how to give simple First Aid.	1. Inspect first aid box and name the contents. 2. Practise giving simple First Aid.	First Aid box and materials.	Students to: 1. define First Aid; 2. list five First Aid materials; 3. apply simple First Aid measures.

2:2F

JS TWO

THEME 6: ENERGY AND POWER

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES	
			TEACHER	STUDENTS
Energy Based Technological Appliances	Students should be able to: 1. identify and explain the principles of appliances based on conversion of: - electrical energy to heat energy. - chemical energy to heat energy. - electrical energy to mechanical energy. - mechanical energy to electrical energy. 2. distinguish between generators and motors, 3. identify and explain the principles of appliances based on electro-mechanical energy.	1. Principles of operation of pressing iron, electric kettle, cookers and water heaters, gas lamps, gas and kerosene cookers, charcoal pressing iron. 2. Principles of evaporation leading to cooling by refrigerants. 3. Operation of a compressors as responsible for the circulation of the refrigerants, 4. Principles of operation of electric fan grinder. 5. Working principles of generators, bicycles, dynamos.	1. Explains and demonstrates burning of fuel: kerosene in stove, a chemical process. 2. Explains the functions of refrigerants and compressors. 3. Stresses the principle of evaporation as responsible for cooling. 4. Displays appliances. 5. Uses electric fan to demonstrate how the output of mechanical energy varies with the input of electrical energy. 6. Displays various types of generators and motors. 7. Explains the principles and operations of generators and motors.	1. Dismantle appliances and observe their parts. 2. Use immersion heater to observe conversion of electrical energy to heat energy. 3. Use kerosene stove to demonstrate conversion of chemical energy to heat energy 4. Demonstrate with alcohol the principles of cooling and condensation in an enclosed space. 5. Examine and identify appliances. 6. Observe and identify generators and motors. 7. Undertake excursion to the power station or dam.

2:2G

JS TWO

THEME 9: MAINTENANCE

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		T A L M
			TEACHER	STUDENTS	
Simple maintenance	Student should be able to: Carry out basic maintenance of domestic appliances and furniture.	1. Simple maintenance methods: cleaning, dusting, washing, oiling, replacement of damaged parts, etc. 2. Care of common goods: i. kitchen wares: pots, cutlery and knives. ii. electronics appliances, e.g radio, television, etc. iii. other appliances: refrigerator, fans, pressing iron, electric kettles, air-conditioners,	1. Demonstrates basic maintenance practice using common goods. 2. Emphasizes the importance of instruction manuals. 3. Stresses parts of goods that require regular inspection and care 4. Stresses correct and careful use and handling of tools and components with safety precautions.	1. Learn to correctly dismantle and assemble appliances. 2. Practise cleaning, dusting, washing, oiling, repairing and replacement of components.	S h a c n e c a t

JS THREE

2:2H

THEME 1: YOU AND TECHNOLOGY

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS	EVALUATION GUIDE
			TEACHER	STUDENTS		
Career Prospects and Opportunities in Technology	Students should be able to: 1. recognize and appreciate technology related careers; 2. demonstrate interest in the study of technology; 3. make tentative career choice.	1. Technology related careers: Mechanical, Electrical, Civil, Building, Production, Automobile, Computer, and Chemical Engineering, etc. 2. Employment prospects.	1. Lists and explains technology related careers. 2. Undertakes industrial visit with students and/ or organizes film/ documentary.	1. Listen attentively and participate actively in class discussions. 2. Cite other careers in technology.	Pictures of technology practitioners on site.	Student to: 1. mention possible career opportunities in field of technology.

JS THREE

THEME 2: MATERIALS AND PROCESSING

TOPIC	PERFORMANCE OBJECTIVES	CONTENTS	ACTIVITIES		TEACHING AND LEARNING MATERIALS
			TEACHER	STUDENTS	
Production of Materials **(a) Wood**	Students should be able to: 1. define key terms and concepts related to wood processing. 2. describe common timber defects; 3. select suitable timber for simple projects; 4. explain the manufacture of manmade boards; 5. explain the advantages and disadvantages of laminated boards over wood; 6. identify various types and sizes of laminated boards.	1. Timber growth, felling, conversion and seasoning. 2. Properties of good timber preservatives. 3. Common timber defects: twist, bowing, cupping etc. 4. Methods of cutting veneers, veneer and laminated boards. 5. Types and manufacture of laminated boards: plywood, chipboard, block board, etc.	1. Defines key terms and concepts. 2. Displays sample pieces of seasoned and fresh (green) timber. 3. Illustrates with notes and sketches, methods of processing timber. 4. Displays specimen of wood with common defects. 5. Highlights importance of wood treatment.	1. Examine wood specimens for conversion method and defects. 2. Make sketches of defects. 3. Watch films and slides on wood. production/ processing. 4. Examine specimens of manufactured boards. 5.Undergo excursion to saw mills, timber yard/market, etc.	Posters/charts of timber specimens, chain saw, wood machines etc; Timber preservatives.

Appendix 2.3A – 2.3I (Cultural & Creative Arts for Junior Secondary School)

CULTURAL AND CREATIVE ARTS CURRICULUM

2:3A

JS: 1

THEME: ARTS AND CRAFTS
SUB – THEME: CRAFTS

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES	EVALUATION GUIDE
			TEACHER	STUDENTS		
1. Types of Crafts.	Students should be able to: 1. state the meaning of Crafts. 2. list types of Crafts. 3. Give examples of the types of Crafts. 4. state the uses of Crafts.	1. Meaning of Crafts. 2. Types of Crafts: i. Fabric Craft like woven cloth, tie and dye ii. Paper mache iii. Carving Craft like sculpture. iv. Woven Craft like iron window, iron gate, etc. 3. Examples of types of Crafts: • Fabric tie and dye • Paper – Kite, Paper Mache. • Moulded Craft – Vases. • Carving – wood, Calabash • Woven – basketry 4. Uses of Crafts: • Beautification • culture	1. Explains the meaning of Crafts. 2. Explains the uses of Crafts. 3. Displays different Craft items.	Listen and observe the display of different craft items.	Tie and Dye Fabric, Flower vases, Moulded Lizard, Clay products, Carved wood, Calabash.	Students to: 1. explain the meaning of Craft. 2. mention 2 types of Crafts giving two examples of each.

CULTURAL AND CREATIVE ARTS CURRICULUM

2:3B

THEME: ARTS AND CRAFTS
SUB – THEME: CRAFTS

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES
			TEACHER	STUDENTS	
2. **Practical works In Tie and Dye Using Different Methods.**	Students should be able to: 1. prepare the Dye solution. 2. design and dye Fabric in one colour using : i). Tying method ii). Clamping method iii). Folding method. 3. list materials and tools used for tie and dye.	1. Meaning of Tie and Dye. 2. Methods of tying: i). Tying ii). Clamping iii). Folding 3. Materials and Tools for tie and dye: i). Fabric ii). Dye pigment iii). Chemical (Caustic Soda, Hydrochloride) iv). Plastic bowls v). Gloves. vi) Wooden sticks 4. Preparation of dye bath. 5. Dying process.	1. Explains the meaning and types of Tie and Dye. 2. Explains and shows students the different materials and tools used in Tie and Dye. 3. Shows how to prepare the Dye bath 4. Demonstrates how to tie, fold and Clamp Fabrics. 5. Demonstrates how to dye designed fabric. 6. Displays Dyed Fabrics	1. Listen to explanation of the meaning of Tie and Dye. 2. Observe and carry out the following: i). Tying of fabrics using the different tying methods ii) follow teacher's example in preparing the dye bath iii). dye designed fabric and display the fabric iv). dispose of used and spent dye solution appropriately.	Samples of tied and dyed of fabric, dye stuff, plain unstarched cotton fabric, raffia, plastic bowl, gloves, cloth line, pegs.

2:3C

THEME: ARTS AND CRAFTS
SUB – THEME: CRAFTS

JS: 1

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES	EVALUATION GUIDE
			TEACHER	STUDENTS		
3. **Paper Craft using Folding Technique.**	Students should be able to: 1. explain the meaning of Paper Craft. 2. identify the materials and tools for Folding Technique. 3. list the methods of folding used in paper craft. 4. produce a paper craft e.g. Kite, Greeting Card, Hand Fan.	1. Meaning of Paper Craft, 2. Materials and tools for making paper craft. 3. Methods of folding in paper craft making: • Square • Triangular folding • Rectangular • Pleating 4. Paper Craft production e.g. Kite, Greeting Card, Hand Fan.	1. Explains the meaning of Paper Craft. 2. Displays materials used in Paper Craft production. 3. Demonstrates method used in making Paper Craft namely pleating rectangular and triangular folds.	Listen and watch demonstrations of methods used in making paper craft.	Paper, Threads, Crepe Paper, Markers, Colours, Gum, Scissors, Ruler, etc.	Students to: 1. identify materials and tools for paper folding. 2. list method of folding in paper craft. 3. use any of the methods to produce a named Paper Craft.
4. **Collage Production**	Students should be able to: 1. explain the meaning of Collage making. 2. identify materials for Collage. 3. describe the method of making Collage.	1. Meaning of Collage. 2. Materials for Collage making e.g. Coloured Magazines, Scissors, Paper Gum, Cardboard, Drawing book, Pencil. 3. Method of producing Collage.	1. Explains the meaning of Collage. 2. Mentions materials for Collage 3. Demonstrates method of producing Collage.	1. Listen to the explanation of Collage. 2. Identify materials for Collage making. 3. Make collages	. Coloured Magazines, Scissors, Paper Gum, Cardboard, Drawing books, Pencils	Students to: 1. state the meaning of Collage 2. list materials for making Collage. 3. produce a Collage work.

2:3D

THEME: ARTS AND CRAFTS
SUB – THEME: CRAFTS

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES
			TEACHER	STUDENTS	
Modelling with Paper Mache'.	Students should be able to: 1. list products made from Mashed paper. 2. explain the methods of making models with mashed paper.	1. Meaning of paper Mache/ Clay. 2. Materials made from clay and paper Mache' e.g. household utensils such as Plates, Cups, Decorations, Vases, Wall hangings, Moulded animals, etc. 3. Processes of modelling using clay/paper Mache' : • Paper Mache' preparation. • Using Paper Mache' to mould an object.	1. Shows samples of finished products. 2. Explains the methods of making models using paper mache'. 3. Demonstrates how to prepare paper mache'. 4. Asks Students to mould objects using paper mache'.	1. Actively participate in discussion of modelling with paper mache'. 2. Participate in modelling using paper mache'.	Old Newspaper, Paper gum, Spatula, Wooden Boards, Finished paper mache works, Hard boards, photographs.

2:3E

CULTURAL AND CREATIVE ARTS CURRICULUM

THEME: ARTS AND CRAFTS JS: 1

SUB – THEME: CRAFTS

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES	EVALUATION GUIDE
			TEACHER	STUDENTS		
6. **Bead Work**	Students should be able to: 1. explain what Beads are. 2. produce Beaded jewellery 3. state uses of Beads.	1. Definition of Bead work. 2. Production of Beads jewellery using: • beads • Roll paper • Seeds • Straw • Small pieces of wood. • Bottle tops, etc. 3. Uses of Beaded jewelleries.	1. Explains the meaning of Bead works. 2. Guides Students in cutting, rolling, gumming and stringing of Beads. 3. Assists Students to prepare straw, seeds and other materials for Bead work. 4. Makes jewellery with paper, seeds, beads straw etc. 5. States Uses of Beads.	1. Explain the art of Bead making. 2. Participate in the production of Beaded works like necklace, bangles, ear rings, etc. 3. Mention uses of beads.	Roll paper, straw, seeds, bottle tops, elastic thread, threads, needles, scissors, jewellery, small pieces of woods, beads etc.	Students to: 1. name materials for bead making. 2. make a set of jewellery from beads.
7. **Mosaics.**	Students should be able to: 1. state the meaning of Mosaics. 2. list materials /tools used in making Mosaics. 3. enumerate uses of Mosaics. 4. make a Mosaic project e.g. wall hanging	1. Meaning of Mosaics. 2. Materials/Tools for making Mosaics. 3. Uses of Mosaics e.g. jewellery, flower vases, greeting cards, wall hanging. 5. Making of Mosaic projects.	1. States meaning of Mosaics. 2. Displays materials /tools for Mosaic making. 3. Mentions uses of Mosaics. 3. Demonstrates how to make a Mosaic project, e.g. necklace.	1. Listen attentively and ask questions. 2. Examine materials /tools used in Mosaic making. 4. Discuss uses of Mosaics.	Broken bottles, broken China ware, bottle tops, beads, sequins, pen, cartridge, paper plier, knives, paint, brushes, scissors, old newspaper, glue, etc.	Students to: 1. state the meaning of Mosaics. 2. name 6 materials/ tools used in making Mosaics. 3. mention 3 uses of Mosaic. 4. make a named Mosaic article e.g. wall paper, wall hanging, etc.

CULTURAL AND CREATIVE ARTS CURRICULUM

2:3F

THEME: CUSTOMS AND TRADITIONS JS: 1

SUB – THEME: WORK ETHICS

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES	EVALUATION GUIDE
			TEACHER	STUDENTS		
1. Team Work and Sense of Belonging	Students should be able to: 1. explain the meaning of team work. 2. state the importance of team work. 3. explain the meaning of sense of belonging. 4. state how to achieve sense of belonging in the society.	1. Meaning of Team Work. 2. Importance of Team Work. 3. Meaning of Sense of Belonging. 4. How to achieve Sense of Belonging.	1. Explains the following: i). Meaning of team work ii). Importance of team work. iii). Sense of Belonging. iv) How to achieve Sense of belonging. 2. Leads group of students to dramatize how to achieve team work and sense of belonging.	1. State the meaning of team work and sense of belonging. 2. Explain the importance of Team work. 3. Demonstrate how to achieve Team work and Sense of belonging.	Charts showing: - Members of a community, - Young people working as a group . People of different tribes hugging themselves.	Students to: 1. state the importance of Team work 2. mention three benefits of team work.

2:3G

CULTURAL AND CREATIVE ARTS CURRICULUM

THEME: CUSTOMS AND TRADITIONS
SUB – THEME: WORK ETHICS

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES
			TEACHER	STUDENTS	
Consequences of Using Fake and Adulterated Goods.	Students should be able to: 1. state meaning of Fake and Adulterated Goods. 2. mention goods that are often faked and adulterated. 3. state why people sale and distribute fake and adulterated goods. 4. mention the bad effects of the use of fake and adulterated goods. 5. state how to stop faking and adulterating goods. 6. Mention agencies that fight against fake and adulterated goods.	1, Meaning of Fake and Adulterated Goods. 2. Goods often faked and adulterated: • Medicine • Processed foods • Clothing • Fabrics, etc. 3. Reasons why people produce and distribute fake and adulterated goods: • Greed • Lack of patriotism. • Lack of morals • Disloyalty. 4. How to stop the sale of fake and adulterated goods: • Be patriotic • Show love for your people. • Be honest • Respect authority • Know your right as a consumer. 5. Government Agencies that fight the production and distribution of fake and adulterated good. • NAFDAC • SON • NDLEA	1. Explains what fake and adulterated goods are. 2. Leads students to mention fake and adulterated goods. 3. Explains the reasons for production, distribution and sale of fake and adulterated goods 4. Leads students to suggest how to stop the production, distribution and sale of fake and adulterated goods 5. Guides the students to know the agents that fight against fake and adulterates good,	1. Discuss what constitutes fake and adulterated goods. 2. Mention fake and adulterated goods. 3. Suggest how to stop the production and distribution of fake and adulterated goods. 4. Mention government agents that fight against fake and adulterated goods.	- Charts showing fake goods, - Charts showing individuals caught by law enforcement Agencies e.g. NAFDAC and NDLEA. - Charts showing goods with expired dates. Television (TV), DVD. CDs, Newspapers, Radio, sets (Charts or Pictures)

2:3H

CULTURAL AND CREATIVE ARTS CURRICULUM

THEME: CUSTOMS AND TRADITIONS
SUB – THEME: DISCIPLINE

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY		TEACHING AND LEARNING RESOURCES
			TEACHER	STUDENTS	
Self Control	Students should be able to: 1. state the meaning of self control. 2. mention how to exercise self control. 3. state the benefits of self control. 4. demonstrate self control.	1. Meaning of self control. 2. How to exercise self control: • Show moderation • Be modest. • Be content. • Be truthful. • Be considerate. • Don't be in the fighting mood all the time. 3. Benefits of self control. 4. Practicing self control.	1. Explains the meaning of self control. 2. Guides the Students to discuss how to exercise self control. 3. Explains the benefits of self control. 4. Groups the Students to dramatize self control.	1. Discuss self control. 2. Suggest ways to show self control. 3. Suggest some benefits of self control. 4. Practice self control.	Charts showing self control even under provocation. Charts showing reward of self control. Video clips.

THEME: PATRIOTISM
SUB – THEME: UNITY

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITY	
			TEACHER	STUDENTS
nity	Students should be able to: 1. explain the meaning of unity. 2. mention causes of disunity at home, school and in the society. 3. describe how to maintain unity at home and society. 4. show acts that encourage unity.	1. Meaning of unity. 2. Causes of disunity in the home, school and society. 3. How to maintain unity: • Be tolerant • Be fair to all • Be sincere • Be cautious • Respect other opinion • Be accommodating • Avoid cheating • Be honest 4. Demonstration of acts of unity	1. Explains the meaning of unity. 2. Explains causes of disunity in the home, school and society. 3. Guides students to suggest and discuss how to maintain unity at home, school and society. 4. Group students to write a play on how to maintain unity at home and society emphasizing religious and cultural tolerance.	1. Discuss meaning of unity. 2. Suggest some causes of disunity in the home and society. 3. Write a play on how to maintain unity at home and society. 4. Act a play written by one of the groups.

Appendix 2.4A – 2.4Q (Religion and National Values for Junior Secondary School

2:4A

RELIGION AND NATIONAL VALUES CURRICULUM

THEME: CRS
SUB- THEME: GOD AND HIS CREATION

JSS ONE

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITIES		TEACHING AND LEARNING RESOURCES	EVALUATION GUIDE
			TEACHER	STUDENTS		
Disobedience	Students should be able to: 1. Recognize disobedience as sin. 2. Give Biblical account of first human disobedience. 3. Recall their own acts of disobedience. 4. Identify consequences of disobedience against the national laws, eg vandalism on public properties, disobeying traffic light, etc.	1. Biblical account of first human disobedience Gen 3:1-19. 2. Consequences of Adam and Eve's disobedience Gen.3:14-19. 3. Learner's disobedience and consequences 4. Disobedience against the national laws	1. Explains meaning of disobedience. 2. Leads students to recognize disobedience as sin. 3. Guides students to read Bible passages. 4. Guides students to respect and obey the laws of the nation using the national pledge.	1. Read individually the Bible passages. 2, Participate and copy down points in their notes. 3. Write apology letters to parents. Bring reports of parents feeling at receiving apology letters. 4. Recite the national pledge.	1. Bible 2. Educational television 3. Film strips, 4. Projectors. 5. Students as learning resources. 5. Printed or written copy of the national pledge.	Students to: 1. Explain the term disobedience. 2. Give a Biblical account of the first human disobedience. 3. Mention two consequences of the disobedience of Adam and Eve. 4. State three acts of disobedience common among Nigerian Youths today.

RELIGION AND NATIONAL VALUES CURRICULUM

THEME: CRS
SUB-THEME: KEEPING GOD IN OUR RELATIONSHIP

2:4B

JSS ONE

TOPIC	PERFORMANCE OBJECTIVES	CONTENT	ACTIVITIES		TEACHING AND LEARNING RESOURCES	EVALUATION GUIDE
			TEACHER	STUDENTS		
Relationship in the Family.	Students should be able to: 1. Mention the different types of families. 2. Mention names of their family members and draw the family tree. 3. Identify roles of members of the family. 4. State the attributes of a good family name.	1. Meaning and types of family 2. Recognition of family members 3. Different roles of members of the family. Eph. 6: 1-9; 5:21-33 Col. 3: 18 – 21; I Pet. 3:1-7. 4. Types of family.	1. Guides students to draw the family tree. 2. Explains different roles of family members.	1. Participate in class discussions. 2. Draw their own family trees. 3. Listen and read in turns the Bible passage. 4. Mention some families in the community.	1. Pictures of family members. 2. Flash cards bearing names of persons. 3. Drawing showing family tree of Jesus. 4. Students as learning resources.	Students to: 1. write names of three (3) members of their family. 2. identify different types of family. 3. mention three roles of members of the family. 4. mention two things that help to maintain a family name/reputation.

RELIGION AND NATIONAL VALUES CURRICULUM

THEME: CRS
SUB-THEME: KEEPING GOD IN OUR RELATIONSHIP

TOPIC	PERFORMANCE OBJECTIVES	*CONTENT*	ACTIVITIES		TEACHING AND LEARNING RESOURCES
			TEACHER	STUDENTS	
Relationship in School.	Students should be able to: 1. Write the name of their principals, form masters/ mistresses, subject teachers, etc. 2. Identify the factors that aid them in choosing friends. 3. Explain why they should choose and maintain good friends. 4. Identify the evils of bad friendship.	1. Names of members of the school, (School, principals, subject teachers, prefects, friends, etc). 2. Choosing friends at school factors: common interest, age, religion, etc. (a) Friendship between David and Jonathan 1 Sam. 18:1-5. (b) The friend at mid-night Luk.11:5:13 3. Bad friendship leads to cultism, stealing, drug addiction, prostitution, lesbianism, homosexuality, smoking, drinking, laziness, truancy, etc. Prov.1:10; II Thes. 3:6-13	1. Guides students to list names of principal, teachers, etc. 2. Guides students on how to identify genuine friends. 3. Tells and leads students to read relevant Bible Passages. 4. Guides students to role-play or (and) mime the story of the friend at midnight. 5. Leads the students to identify evils of bad friendship.	1. Write down names of teachers and their subject areas. 2. Mention factors that aid them in choosing friends. 3. Mention qualities of good friendship. 4. Mention social evils among youths. 5. Role play the friend at midnight;	1. Students and school environment as learning resources. 2. Wall charts showing qualities of genuine friendship. 3. Loaves of bread, Mats, Classroom chair and space.

Appendix 3.1 (R1)

Appendix 3.2 (R2)

Appendix 3.2b (R2)

Appendix 3.3 (Oil spillage in Farmland)