



A REVIEW OF ENVIRONMENTAL QUALITY STATUS OF NIGERIA INTEGRATING SUSTAINABLE DEVELOPMENT GOALS AND LIVABILITY WITH AGENDA 2040

Nwachukwu M. A.¹
Nwachukwu J. I.²

ABSTRACT

Problem: Nigeria's environmental quality and livability indices are among the worst in the world. Due to pollution, terrorism, and unbearable environmental stress (UES) causing poverty and diseases, no one wants to live in Nigeria anymore. The country's environmental issues have worsened the quality of life, and without improvements, Nigeria risks becoming the nation with the highest cancer rates globally. There is an urgent need for Nigerians to focus on improving environmental quality to enhance the quality of life, especially in the absence of adequate medical facilities. **Objective:** The purpose of this study is to highlight the importance of improving environmental quality in Nigeria to achieve the Sustainable Development Goals (SDGs) by 2040, as the 2030 target has already become unrealistic. This research aims to raise awareness about the significance of SDGs in Nigeria, encourage national unity beyond political and ethnic divides, and promote a better Nigeria through the provisions of SDGs and Agenda 2040. **Method:** This research uses a descriptive and analytical approach to evaluate Nigeria's current environmental conditions and its compliance with SDGs. It proposes Agenda 2040 as a pathway for Nigeria to meet SDGs by focusing on improving the four components of the environment: Land, Water, Air, and Society. The study uses qualitative data on environmental issues and an analysis of Nigeria's progress in meeting SDGs. **Results:** The findings suggest that without the implementation of Agenda 2040, Nigeria will struggle to achieve SDGs. By 2030, Nigeria is expected to be only 24% compliant with SDGs. Therefore, the study advocates for the adoption of Agenda 2040, which consists of 10 environmental pathways to improve the country's environmental quality and raise awareness about the importance of SDGs. The Agenda is seen as a critical strategy to tackle pollution across the four environmental components and build national consciousness toward the effective achievement of SDGs.

Keywords : Pollution; Environmental quality; Insecurity; Diseases; Sustainability; Domestic Agenda

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1. INTRODUCTION

Nigeria is one of the most populous country in the world with a population of 227,882,945 people and an annual rate per CPI of 23.7% as at April 2025, and a public debt per capita of \$436 per person (countryeconomy.com/2025). Environment is life,

¹ Department of Environmental Management, Federal University of Technology Owerri, Nigeria. Email: nwachukwu.ma@futo.edu.ng

² Department of Environmental Management, Federal University of Technology Owerri, Nigeria. Email: nwachukwuji@futo.edu.ng

therefore to be healthy, you must live and operate in a stress free environment. Living in a stress free environment means that all vices of environmental degradation are avoided or minimized, such that: Air is clean, not polluted; Water is clean, not polluted; Soil is not polluted and Society is not polluted or corrupt. There is strong relationship between poverty and the environment. It is very important to recognize that poverty and environmental problems always have a meeting point and in all cases, the poor is endangered. Poverty among people puts stress on the environment and environmental stress causes poverty and severe suffering to the poor. People, whether they are rich or poor, consume water, food, and natural resources in order to remain alive. If you live or have your business premises in area where you breathe contaminated air, such as near a waste dump, sewage drain, industrial fumes, automobiles and generator smoke etc., the case with most Nigerians living in cities, are exposed to airborne diseases that could subject the individual or family to poverty and hardship. In Nigeria notably, the poor masses live in slums where house rent is relatively low and environment totally neglected.

People buy farm products harvested from contaminated farm lands and are exposed to toxic foods and several diseases. Today Cancer has become a household name in Nigeria unlike it was known in the 20th century. Research has shown that long-term exposure to trace metals in foods can cause different types of cancer diseases. The cost of treating a cancer patient can put any family into poverty and hardship. This is true because the individual may stop functioning or functioning at lower capacity or may die, being the family breadwinner; the family now faces poverty and hardship. A disease that can subject a family into unbearable stress could result from environmental neglects like poor sanitation.

Nigerians have continuously blamed government for not providing medical facilities or standard hospitals or for not giving adequate attention to the health sector. This type of blame is secondary since prevention they say is better than cure. The masses should blame governments primarily for the poor environmental quality in Nigeria. Poor environmental quality brings poor quality of life as environment is life. Good environment is next to heaven, while polluted environment is next to hell. There is strong relationship between poverty and environmental stress. Poverty brings poor environment quality. Poor environment quality causes environmental stress and long exposure to environmental stress causes untimely death through cancer and other environmental related diseases. Other vices of environmental stress in Nigeria are exposure to sachet water of poor quality produced from shallow substandard wells, exposure to lack of water and poor sanitation, exposure to heat and tensions due to no electricity.

Further dimensions of environmental stress often neglected by most people but could manifest into complicated diseases and untimely death include; withholding of urine and stool due to no toilet facilities. Environmental stress also occurs when waste is littered or dumped near residential and business areas, causing human exposure to mosquitoes, tsetse flies, reptiles and rodents, thus bringing down the dignity of man. Nigerians largely depend on groundwater for their daily water needs and failure of governments to take responsibility of water production and services has resulted to households, organizations and individuals producing their water. Consequently, there is proliferation of shallow substandard water wells producing water of poor quality and increasing environmental stress and disease burden in Nigeria. Victims of these vices in Nigeria deserve free medical and

compensations to live with, but a solution to the overall problems of environmental stress is presented in this paper.

Environmental stress adds more to the miseries of the small and the mighty in Nigeria. For example, the prevalence of gullies and abandoned mine pits cause great concerns to citizens as they become hideouts for criminals; kidnappers and ritual killers. The poor farmers are threatened by ritual killing, resulting to shortage of farm products, and hunger, while the wealthy are kidnapped for ransom, robbed and often killed. Again, as soil and surface water in mining districts become increasingly contaminated due to illegal and unsustainable mining practices, the poor farmers and the general public suffer the health consequences of heavy metal exposure as no one knows who purchases or eats farm products cultivated from such farm lands. In the case of poor drainage in urban areas across Nigeria, the poor masses suffer most as lack of proper drainage system increases environmental stress due to the impact of flooding in low-income residential areas often cause displacement of homes or communities.

The use of open drainage system in most Nigerian cities and blocking of the drainage channels with urban solid waste contributes more to environmental stress, following breeding of mosquitoes and reptiles, and increasing the prevalence of malaria and typhoid fever. Soil erosion in the southeastern Nigeria lead to a decline in food production and leading to inflation and subjecting the poor masses to hunger. The poor experiences greater environmental stress as illustrated in figure 1. The four components of the earth environment in Nigeria thus Air, Land, Water and Society are increasingly polluted and there is little to no solution efforts made at this time. Nigerian society is most corrupt, and a corrupt society is a polluted environment. Corruption in Nigeria combines dishonest public service with looting of public treasury and insecurity, thus subjecting the poor masses to abject poverty.

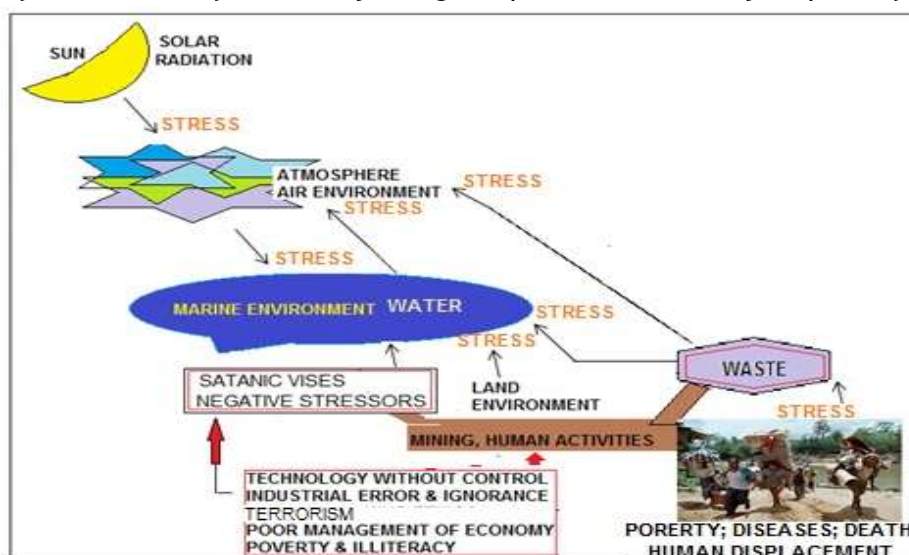


Figure 1. Effects of Environmental Stress

Sustainable development goals and poverty alleviation in Nigeria will emphasize eliminating environmental stress due to corruption or pollution of society, improved public power supply, good quality public water supply and sanitation, improved air quality and decontamination of arable land. Research has shown that the four components of environment, representing the total environment in Nigeria is

polluted. When pollution is combined with unsustainable development, it results in Poor Environmental Quality (PEQ).

2. THEORETICAL FRAMEWORK

This framework will include key components that connect environmental quality and livability indices with Nigeria's environmental stress, Sustainable Development Goals (SDGs), and Agenda 2040. We will also highlight the relationships between these components (such as Poor Environmental Quality (PEQ), Environmental Stress (ES), and its effect on Livability).

3. METHODOLOGY

Methodology:

The research approach will be quantitative and descriptive, using observational methods to analyze the current environmental stressors and their impact on achieving SDGs in Nigeria. The methodology also involves using a cross-sectional approach to assess the relationship between environmental factors and the progress of Nigeria toward achieving SDGs by 2030 and 2040.

4. RESULTS AND DISCUSSIONS

Review of the Sources of Nigeria Environmental Stress

Nearly all the six geopolitical zones of Nigeria are endangered by environmental hazards and conflicts causing environment stress and poor quality of life. Poor environmental quality (PEQ) causes Environmental Stress (ES); ES causes Poor Quality of Life (PQL); PQL accommodates Insecurity, Diseases and Poverty (IDP); IDP is the root cause of Low Livability Index (LLI) and the possibility of failure to achieve UN SDGs in Nigeria by year 2030. Below are 15 environmental stressors holding down the development of Nigeria.

Poverty

Nigeria is the 3rd highest poverty rate in the world with 70.7% of its population living in poverty, coming after south Sudan and Somalia as projected by; <https://sapa-usa.org/countries-with-highest-poverty-rate/> Nwachukwu (2014) in his book; environmental education manual, described poverty as a socio-environmental issue that cannot be treated by way of palliative or minimum wage in Nigeria, rather by total engagement of citizens to some means of livelihood. Poverty is a curse to a person or nation.

Lack of portable public water supply

Only 26.5 per cent of the Nigeria population have improved drinking water sources and sanitation facilities. <https://www.unicef.org/nigeria/water-sanitation-and-hygiene> Nwachukwu (2010d and 2012) described water as life, stating that quality of life largely depends on the quality of drinking water accessible to man, and that proliferation of shallow substandard water wells in homes across the country is not a sustainable groundwater development and cannot replace public water services as most of the home wells produce water of poor quality. Many Nigerians flee due to prevalence of waterborne diseases. Consequently, Nwachukwu et al. (2013b) used Geographic Information System (GIS) to map groundwater prospect areas of Imo River Basin Nigeria, in order to reduce cases of failure in groundwater development.

Oil spillages in the Niger delta region

An estimated 13 million barrels (1.5 million tons) of crude oil have been spilled since 1958 from over 7000 oil spill incidents; a yearly average of about 240,000 barrels. Six decades of oil exploration have made the Niger Delta one of the most polluted places on earth and damaged a lot, including farmlands, biodiversity and ecosystem. <https://www.aljazeera.com/features/2022/9/9/niger-delta-oil-spills-bring-poverty-low-crop-yields-to-farmers>. Nwachukwu et al. (2024, 2018a) described oil spills and poor management of waste water resulting from oil and gas operations as a curse to Niger delta region of Nigeria as it causes soil, water and air pollution, and often community displacement.

Gas flaring in the Niger delta region

Nigeria rank 7th largest gas flaring country in the world. According to a world bank group: Global Flaring and Methane Reduction Partnership (GFMRP) 148 billion cubic meters of associated gas was flared at upstream and downstream oil and gas plants in 2023. The resultant excessive heat, greasy skin and roofs make human habitation uncomfortable. Besides, it causes detrimental consequences to the entire ecosystem as well as waste energy and economic loss (Ukhurebor et al. 2024).

Mine waste discharge to farm lands

Unsustainable solid mineral mining practices across Nigeria leaves much on environmental degradation. For example, the discharge of waste water from Pb-Zn mines to farm lands within Lower and mid Benue trough, particularly areas of Abakaliki, Ishiagu, Wanikande and Gabu-Oshina in Ebonyi and Benue states. Our findings as contained in Odoabuchi et al. (2020) shows anomalous concentration of Pb, Cd, Mn, Zn, Ca, K, Na, Mg, and pH in the mine water discharged to farm lands. Drainage analysis showed about 74 acres of arable land with contaminated topsoil in Ishiagu mining area calling for remediation.

Automobile exhausts, Generators and industrial fumes

Automobile exhaust and generator emissions are major sources of air pollution in Nigeria, contributing to health issues and environmental degradation. According to Vanguard Newspaper September 1, 2018, Nigeria ranks 4th deadliest country globally on these emissions and has the highest maternal mortality in the world. It has the highest burden of fatalities from air pollution in Africa. Awefeso (2011c) reported that automobiles and generator exhaust contains more than 40 toxic air contaminants, including many known or suspected cancer-causing substances, such as benzene, arsenic, and formaldehyde.

Automobile wastes from mechanic villages and auto repair shops

Automobile waste from mechanic villages in Nigeria is a significant environmental concern. The waste includes lubricants, gasoline, diesel, spent electrolyte, spent carbide, iron and aluminum fillings, paints and spent engine oil. These wastes constantly disposed on the ground in mechanic villages contaminates soil and groundwater, which can harm human health and plants. Nwachukwu et al. (2010a, 2010b, 2011a, 2011b 2013, 2014 & 2017) worked extensively on the mechanic village concept and finally developed the Concept and Design of Environmentally Friendly Automobile Mechanic Village.

Terrorism and Insecurity

Boko Haram in the Northeastern part of Nigeria cause environmental degradation by taking advantage of the situations of violence created to enable colonization of expensive solid minerals by western allies in collaboration with some corrupt Nigerians. This has been going on for over 10 years in the region. Society and other environments of Borno, Yobe and Adamawa States are devastated, with a significant population of citizens fleeing the insurgency (Usman, 2022). Nigeria is currently ranked 8 on the Global Terrorism Index of 2024, following report of the Institute for Economics & Peace. Insecurity on the other hand is now a major business and industry in Nigeria whereby there is no safety of life and property from village community to urban community across the country. Hundreds of people are killed for rituals, kidnapped for ransom, and properties destroyed on daily bases, overwhelming the capacity of Nigeria security operatives.

Desert encroachment

Desertification is the most critical environment issue in Northern Nigeria despite attempts by government and the international community at checking desert encroachment through afforestation, or green walls. According to Mohamed and AbdelRahman (2023) Nigeria loses over 350,000ha of arable land annually to advancing desert, affecting about 30million people. The worsening problem of desertification is quite glaring as an estimate of between 50% and 75% of Adamawa, Bauchi, Borno, Gombe, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe, and Zamfara states in Nigeria are directly affected. It is estimated that Nigeria loses about \$5.1billion every year owing to rapid encroachment of drought and desert in the affected states. Desertification is approximately 580, 841 km² and accounting for up to 63.8% of the Nigeria landmass. Due to this development and social factors, Nigeria is most vulnerable to climate change impacts, ranked 160 out of 181 countries in the 2020 ND-GAIN Index.

Open grazing

In 2024, Nigeria ranked 120 out of 142 countries on the World Justice Project's Rule of Law Index, making it difficult to enforce anti-open grazing laws (AOGs) in Nigeria. <https://worldjusticeproject.org/rule-of-law-index/country/Nigeria> The truth is that desert encroachment caused depletion of grazing zones, intensive heat, among other challenges, and caused southward movement of herders in search of green pastures. This southwards movement brought about disagreements among states in the south on accommodation of herders and their open grazing in Nigeria. This disagreement brought forceful southward advancement of herders grazing into farmlands and destroying crops. This brought about regular clashes between farmers and herders. Sponsors of herders who are also supporters of open grazing supplied the herders with AK 47 rifles to get rid of any person obstructing open grazing. This has not only resulted to killing of farmers and often cows, but has advanced into kidnapping for ransom, ritual killing and raping across the country by the herdsmen (Sahara Reporters June 10, 2021). Onyishi et al. (2023), assessed the implications of killer herdsmen in the North and the unknown gunmen in the south, for the terrorism industry in Nigeria and described the situation as terribly affecting livability.

Gully Erosion

In the southeast, erosion is taking its toll on the loss of land and ancestral family properties. Gully erosion has devastated arable land in no small measure displacing farmers and often community settings. This has not only resulted in shortage of farm produce, but increasing hunger and poverty. Major gully erosion sites in the south-east are now criminal dens, where kidnappers and ritual killers dwell, scaring away land owners, security personnel and innocent citizens from such areas. Major gully sites in south-eastern Nigeria can be located at Nanka, Ideato North and South, Orlu, Njaba, Ihitte-Uboma, Amucha, Okwudor, Umuagor, Urualla, Apkulu, Ohafia and Isu Njaba just to mention a few. Nigeria is about the 3rd country with the highest rate of soil erosion in Africa. A gully 15-18m deep, 9-12m wide and 6.5km long is advancing aggressively, threatening life, property, food production and security of ecosystem in Akpulu and environs (Nwachukwu and Owette (2015).

Abandoned Mine pits

Abandoned mine pits including borrow pits are wide spread across Nigeria, and are other areas of insecurity in Nigeria that need to be identified and mapped out for constant surveillance. These pits often turned waste dump sites or allowed to contain contaminated water over years, become point sources of groundwater pollution (Nwachukwu et al. 2017). Similarly, illegal mining of solid minerals across Nigeria and the wide spread of abandoned mine and trial pits cause environmental degradation as the pits turn to waste dumpsite and become point sources of groundwater pollution. Unsustainable mining particularly of lead-zinc minerals along the mid and lower Benue trough of Nigeria leave adjoining farm lands polluted by the mine waste water Odoabuchi et al. (2020). Who knows who will buy or eat cassava or yam produced from such lead-zinc contaminated soil, and what becomes of the people quality of life after many years of exposure.

Power supply

Nigeria's national grid generally lags behind other African countries in electricity supply negatively impacting production and increasing environmental stress. According to the IEA, Nigeria ranks around the 5th position in Africa for total energy supply, despite its large oil and gas reserves. In 2024, Nigeria ranked 108th in the Energy Transition Index (ETI) for African countries. Nigeria generates 36,037 GWh of electricity annually, to become the 67th in the global rankings. In 2022, 60.5% of Nigeria's population had access to some unreliable form of electricity supply, while about 40% have no access to electricity. This situation places Nigeria at a low development index. In 2024, Nigeria's Human Development Index (HDI) was 0.548, ranked 161 out of 189 countries (www.undp.org/2023-2024). According to the 2022 Environment Performance Index (EPI) in Nigeria is low due associated stress.

Waste Dumping

Nigeria ranked very poorly in waste management, placed among the worst performing countries globally, with a score significantly below average compared to other nations, particularly in the Sub-Saharan African region; effectively putting Nigeria near the top of the list for worst waste dumping practices worldwide. With a score of 12.7 out of 100, Nigeria environmental performed index as at 2022 was way below average compared with the performances of its neighbors in the sub-Saharan

Africa. It was on this note that (Nwachukwu, 2010e) investigated indiscriminate dumping of local wastes in open pits and trans-border wastes dumping along the Atlantic coast of West-Africa and discovered that such nefarious activities degrade total environment in Nigeria. Iheriohanma, et al. (2023) condemned waste dumping in open markets and described open market system in Nigeria as unsustainable.

Furthermore, Nwachukwu and Feng (2010f) made a critical review of the management options for end of life vehicles (ELVs) and waste electrical/electronic equipment (WEEE) in the 21st century They categorized the existing management options into upstream and downstream strategies, where Upstream integrates extended producer responsibility, recycling and reuse of the materials, enhancing dismantle-ability of products from the design stage, and vehicle mercury switch recovery program. Similarly, downstream integrates; intensive awareness program, partnership arrangements, repository facility for e-waste, environmentally friendly automobile mechanic village, then recycling and reuse (in a more convenient order). Dumping of hazardous waste is a major source of environmental stress in Nigeria.

Corruption

Corruption and insecurity amounts to contamination and pollution. A corrupt society is a polluted environment. When contamination exceeds certain threshold, it becomes pollution. Nigerian society is a polluted and unsafe environment. Corruption Perceptions Index by global anti-corruption watchdog; Transparency International (2024) placed Nigeria at 140th position out of 180 countries in the global index, where the country ranked first is perceived to have the most honest public sector. Accordingly, Nigeria is now the 26th most corrupt country globally. This corruption remains a significant threat to environmental development, quality of life and livability, and a major source of environmental stress.

Sustainable Development Goals and Environmental Stress

After 9 years of declaring sustainable development goals (SDGs) by the United Nations, it has become necessary to look inwards and investigate the possibility of Nigeria achieving the SDGs by year 2030 in the presence of increasing environmental stress largely sponsored by poverty. To this end, a critical assessment of the 17 SDGs largely based on our research findings is hereby presented and this is followed by what becomes a way forward.

Poverty SDGs (1)

Decline in the value of Naira significantly impacts poverty level in Nigeria, causing reduction in purchasing power. Nigerians are subjected to increasing corruption creating avenue for dishonesty in public service and looting of public fund by few opportunists and politicians. Poverty is the most crucial of all the SDGs as it relates to virtually all other goals and Nigeria standing among the poorest countries in the world has not put in-place any economic strategy to eradicate poverty by year 2030. Salary increases, palliatives and procurement of loans are temporary therapies that cannot eradicate poverty anywhere in the world. Industrialization strategies to foster employment still remain the way out. Nigeria is not destined to be poor, rather poverty in Nigeria is self-inflicted and a course to the country (Nwachukwu et al. 2014). Poverty causes environmental stress and environmental stress causes

poverty. With increasing levels of poverty and environmental stress in Nigeria, poverty eradication by year 2030 is not feasible.

Hunger SDGs (2)

Erosion menace in the southeastern Nigeria particularly the prevalence of gully erosion and desert encroachment in northern Nigeria are environmental stressors threatening eradication of hunger or achievement of (SDGs 2) in Nigeria. Other technical forces threatening SDG 2 also exist, but over 350,000ha of arable land is lost annually to advancing desert (Mohamed and Rahman (2023), while erosion threatens over 6% of arable land predominantly in the southeastern Nigeria according to world bank documents and report (2020). Gully erosion sites are danger zones to farmers, where criminal could hide for nefarious activities including ritual killings and this cause quantum reduction in food production in Nigeria. Open grazing into farm lands and oil spills at a yearly average of about 240,000 barrels in the Niger delta region of Nigeria are other source of food insecurity increasing hunger. Open grazing, oil spillages, erosion and desert encroachment therefore could increase hunger and preventing achievement of SDGs 2 in Nigeria by year 2030, despite calls for sustainable agriculture (Nwachukwu and Egwuonwu, 2013c).



Figure 2. Sections of Akpulu Gully Erosion Site (Nwachukwu and Owette, 2015).

Good Health and Well-being (SDG 3)

Poor waste management including automobile waste from auto mechanic villages (Fig 3a), mine waste discharge to farm lands, poor management of market and hospital wastes, indiscriminate dumping of domestic and industrial wastes along stream banks (Fig 3b) are major issues militating against good health and well-being of Nigerian citizens. Dumping of transboundary wastes along the Nigeria Atlantic coast of West-Africa is another poor waste management issue of great concern. On the whole, the problem of poor waste management in Nigeria is deep into the society. Waste is littered in homes and in public places and sewage is not treated but disposed to isolated farm lands. The result is poor environmental quality that threaten quality of life and food safety. The practice of poor waste disposal including dumping of urban wastes into open drainage channels and littering of cattle dungs in watersheds causes pollution and danger to public health. A fundamental waste management issue is poor waste management resulting from oil and gas operations in Nigeria. All these waste management issues are impacting quality of life and capable of preventing good health and well-being across the country or preventing achievement of SDGs 3 in Nigeria by year 2030.

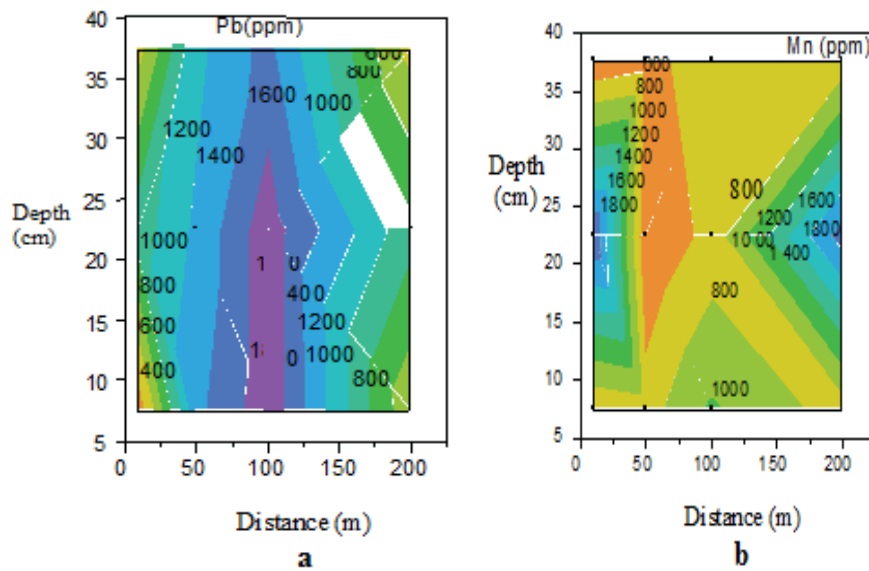


Figure. 3a. Pb, Mn, Cu, Zn disperse from Nekede MV (Nwachukwu et al. 2011a)



Figure. 3b. Leachate from dumpsite Otamiri R Bank (Nwachukwu et al. 2008)

Quality Education

The issue of quality education is not contested in this paper as quality goes with level of education and this is not contested. The UN Decade of education for sustainable development movement failed to achieve its goal in Nigeria as at 2014. This failure can be attributed to environmental illiteracy which Nwachukwu (2014a) and Nwachukwu (2014b) wrote a basic book and presented a wall chat (Fig. 4a) on environmental education for schools and the general public. There was no environmental science education in early school to university until recently after the 1987-1988 toxic waste dumping in Koko Delta state. As a result, all adults; the working class, the business class, policy makers and all persons in the corridor of power know little to nothing about environmental management or sustainable development. whereas, environmental education is education for all and for sustainable development. Environmental science is yet elusive in Nigeria secondary school curriculum and not a WASC/NECO exams subject. Nevertheless, quality education at all levels from preprimary to primary, to secondary and to tertiary institutions, whereby the youths could acquire special trainings and skills for employment and job creation is achievable in Nigeria by year 2030. This calls for a comprehensive review of school curriculum at all grades.



Figure. 4a. Environ Education Wall Chart (Nwachukwu et al. 2014b)

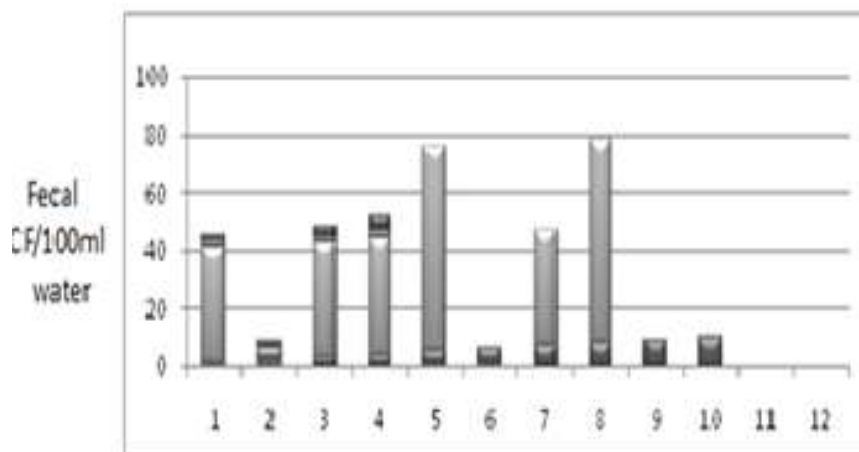


Figure 4b. Coliform Pollution (Nwachukwu et al. 2014b)

Gender Equality

The issue of gender equality cannot be achieved here in Nigeria by year 2030 due to existence of natural, religious and cultural factors. These limiting factors already create controversy about equality of male and female gender to the point that even the females at certain quarters do not buy the ideas of equality. Technically females are no longer restricted from contesting with the males and in education opportunities, the female are graciously favored in many Nigerian communities, yet psychologically, the disparity still exist as a tradition. The above factors are yet capable of preventing gender equality in Nigeria even beyond 2030 irrespective of any amount of aggressive campaign.

Clean Water and Sanitation

The dream of every household, organizations including government owned in Nigeria is to develop a private water well representing their source of daily water needs. This is following government inability to provide and maintain public water facilities. As a result, there is proliferation of shallow substandard water well producing water of poor quality while abandoned or abortive water wells litter all over the place causing environmental stress with pollution of groundwater system across the country. Proliferation of shallow substandard water wells in Nigeria is unsustainable and a crime to humanity due to the high rate of contaminants particle capture as illustrated in fig 6 (Nwachukwu et al. 2010c) This development must stop or Nigeria may become the largest cancer nation in the world by year 2040. About sixty percent of the functional wells produce water of poor quality (Nwachukwu et al, 2010d). This sixty percent (Fig 4b) include commercial wells used in production of all manners of sachet water (Alias pure water) sold to door steps and hawked along streets and road intersections all over the country. Long time exposure of human subjects to this sachet water is suspected to be responsible for the prevailing high rate of untimely death associated with cancer related diseases in Nigeria.

The truth is that most owners of private shallow water wells cannot afford the cost of developing a standard water well. Unfortunately, their water wells are directly exposed to infiltration of surface contaminants. This happens because most of the water well contractors are quarks (nonprofessionals) who venture into such business to make a living. Secondly, most owners of these substandard shallow water wells are ignorant, or not worried about the water quality. Fig 5a illustrates the common design of such substandard water wells as used in different parts of Nigeria, particularly where water table is near surface, while Fig 5b shows the design of a standard water well professionally. The key features of substandard water wells include: Shallow depths achieved by manual drilling; Well annulus left open, no sand filling; Use of inferior casing pipes and screens; No cement grouting; No airlifting to cleanse the well; Inferior submersible pumps; Environmentally poor selection of the water well site etc.

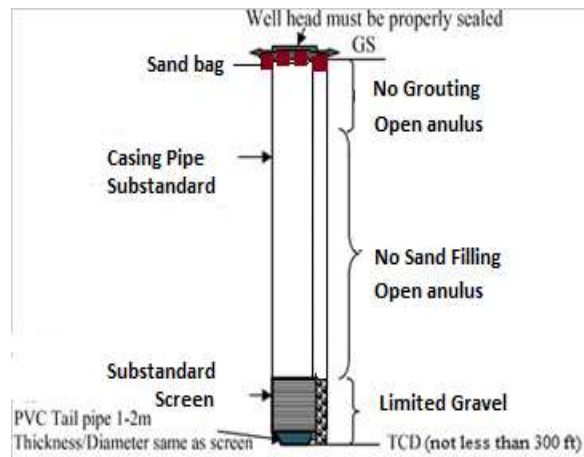


Figure 5a. substandard water well design

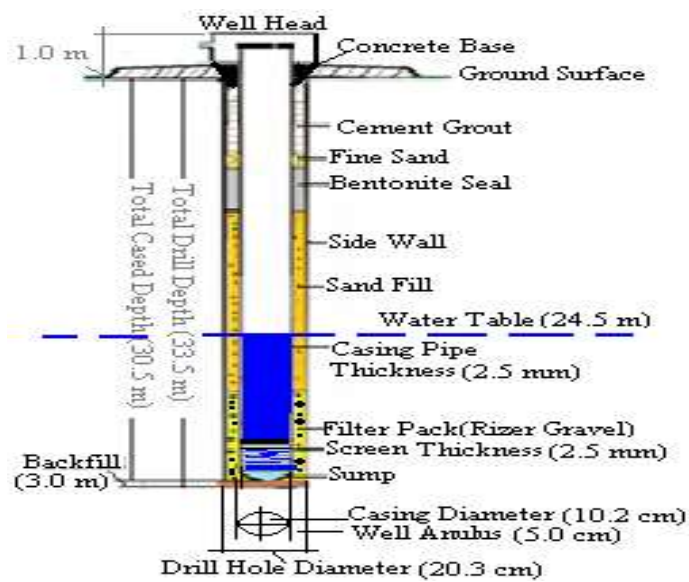


Figure 5b. Standard shallow well design

Shallow substandard wells as illustrated pollute groundwater system and poor water quality of shallow wells cause diseases to the consumers. This development produces environmental stress that stands against the achievement of SDGs 6 by year 2030.

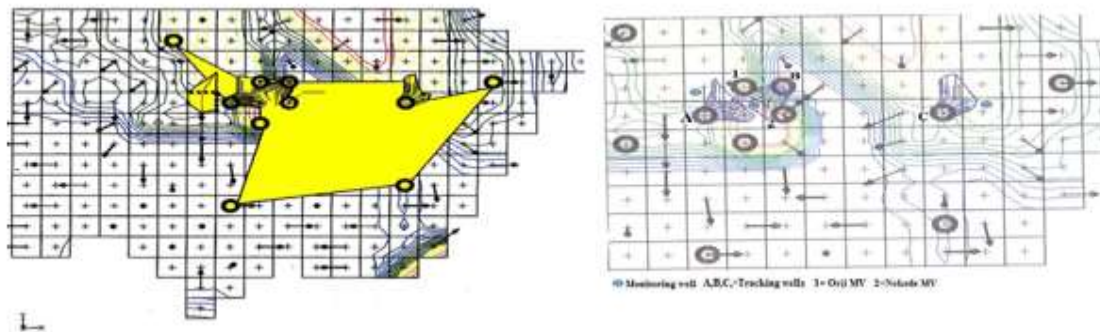


Figure 6. Groundwater flow and Particle capture SE Orji and Nekede MVs. (Nwachukwu et al. 2010c)

Affordable and Clean Energy SDGs 7

Nigeria is a large country that should not depend on one national grid of electricity for the entire energy need of the country. It is time for every state to establish energy companies based on alternative energy sources and Nigeria is in a good position to combine fossil fuel, hydro and solar energy sources to achieve regular energy supply that would be affordable and clean by year 2030. Irregular or total absence of electricity supply is the root cause of environmental stress and economic stagnation in Nigeria and if the power that be recognizes this, and decides to make a change, Nigeria will achieve SDGs 7 by year 2030.

Decent Work and Economic Growth (SDGs 8)

Achievement of SDGs 7 implies that Nigeria is also in position of achieving Decent Work and Economic Growth (SDGs 8) by year 2030 if corruption of society permits. In other words, achievement of SDGs 7 will bring along SDGs 8 by year 2030 if strict laws with capital punishments are made to overcome corruption.

Industry Innovation and Agriculture SDGs 9

Achievement of SDGs 7 again implies that Nigeria is also in position of achieving industry innovation and agriculture (SDGs 9) by year 2030. In other words, achievement of SDGs 7 will enable achievement of SDGs 9 by year 2030 if urban and intercity rail transport system is specifically established. In the absence of intercity and interstate rail transport to support movement of agricultural products, achievement of SDGs 9 by 2030 is not feasible despite the idea of waste to energy (Nwachukwu et al. 2014a) fig 7a and Linking institutions and neighborhood for sustainable agriculture (Nwachukwu & Egwuonwu, 2013c) fig 7b.

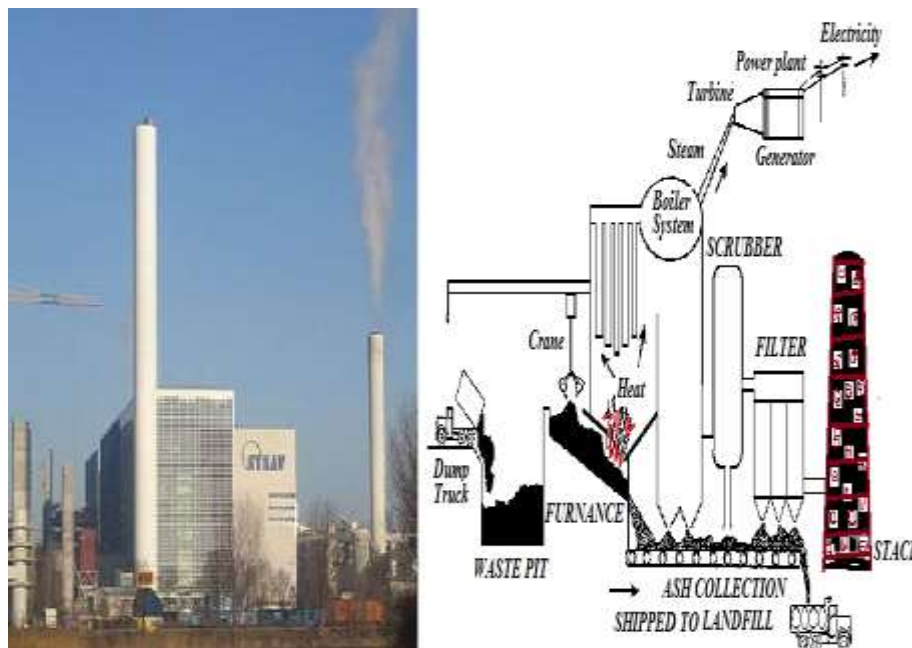


Figure 7a. Waste incineration plant for Energy (Nwachukwu et al. 2014a)

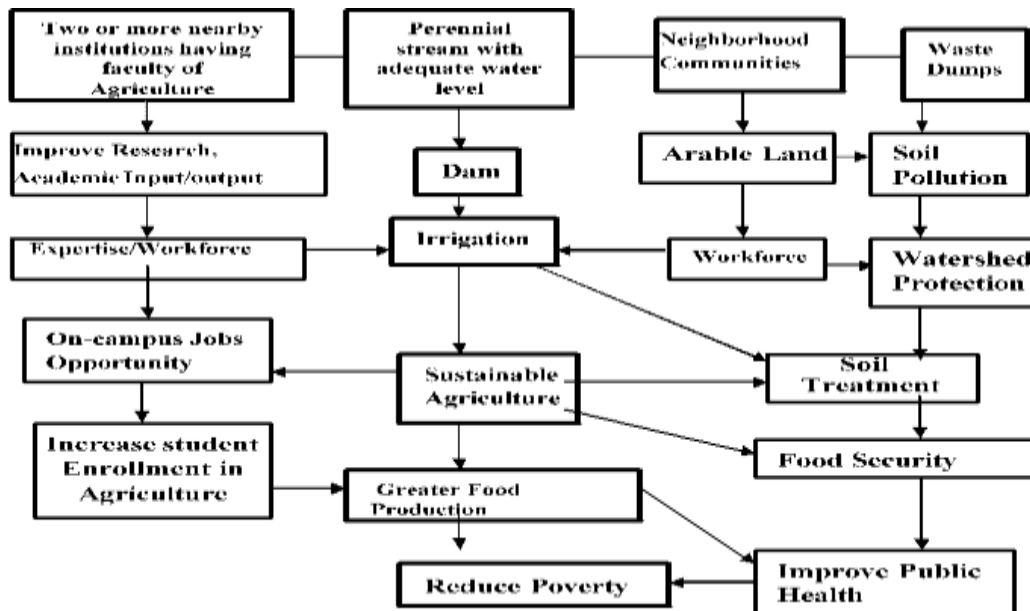


Figure 7b. Framework for Sustainable Agriculture

Reduced Inequalities SDGs 10

Reducing inequalities among persons, organizations, communities and regions, is possible if human ills would permit. Human ills and differences such as corruption, religion, politics, ethnicity and insurgency could stand against reduction of inequalities between states in Nigeria and between developed and the developing countries, thus preventing achievement of SDGs 10 by year 2030 in Nigeria.

Sustainable Cities and Communities SDGs 11

Achieving sustainable cities and communities where transportation and housing are affordable, where environmental quality and quality of life are improved; where water and electricity are available and affordable; where there is no dumping of waste (Fig 8a); where there is no flooding of streets during and after rainfall (Fig 8b) and land pollution by waste automobile engines (Fig 8c). Where food is affordable and available; and where insecurity and natural hazards are minimal. Communities of this nature share less environmental stress and are rare in Nigeria, which implies SDGs 11 is not feasible by year 2030.



Figure 8a. Market Waste Dump (Iheriohanma, et al. (2023a), Figure 8b. Flooding in Owerri (Nwachukwu et al. 2018b), Figure 8c. Junk engines dump Nwachukwu et al. (2013a)

Responsible Production and Consumption SDG 12

Responsible production and consumption assures conservation and efficient use of natural resources; sustainable mining and proper management of mine wastes; Efficient preservation of farm products including meet, fruits and vegetables;

Sustainable industrial practices with reduction of gas emission; Sustainable land use and mitigation of land pollution. These are not likely achievable in Nigeria by year 2030, considering that pollution of air, land and water due to oil spills (Fig 9c); pollution of groundwater from abandoned mine pits (Figure 9b); and land pollution due illegal mining (Fig 9a) create environmental stress enough to prevent SDGs 12 by year 2030 in Nigeria.

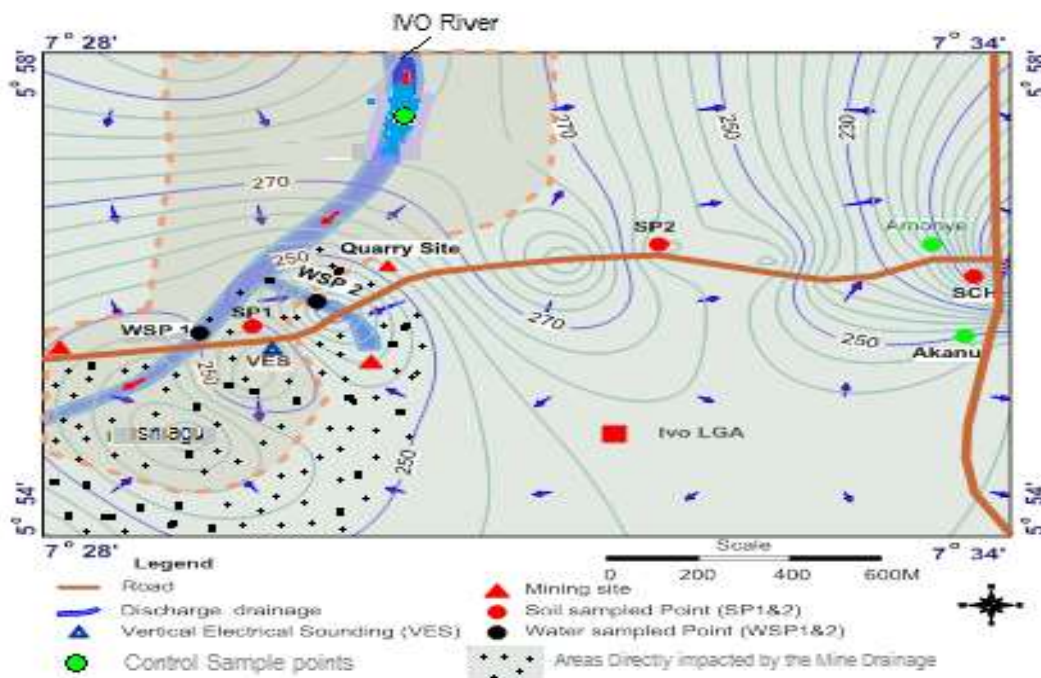


Figure 9a. Pb-Zn impacted land (Odoabuchi et al. 2020)



Figure 9b. Abandoned mine pit (Nwachukwu & Feng, 2012b)



Figure 9c. Waste from Oil/Gas operations (Nwachukwu et al. 2024)

Climate Action SDGs 13

There is still much to border about climate action in Nigeria despite limited industrial infrastructures that promote climate action. The 43% decline of Otamiri

River is attributed to climate action following deforestation of the river banks (Nwachukwu, 2022). Nevertheless, bush and waste burning (Fig 10b), emissions from private power supply generators, automobile emissions and gas flaring (Fig 10a) in the Niger delta region create environmental stress that accounts for climate action that deserve proper attention. It is not likely that Nigeria can make any significant change on the above vices to achieve climate action by year 2030, which implies that SDGs 13 is not feasible in Nigeria by year 2030.



Figure 9a. Gas flaring, Nigeria

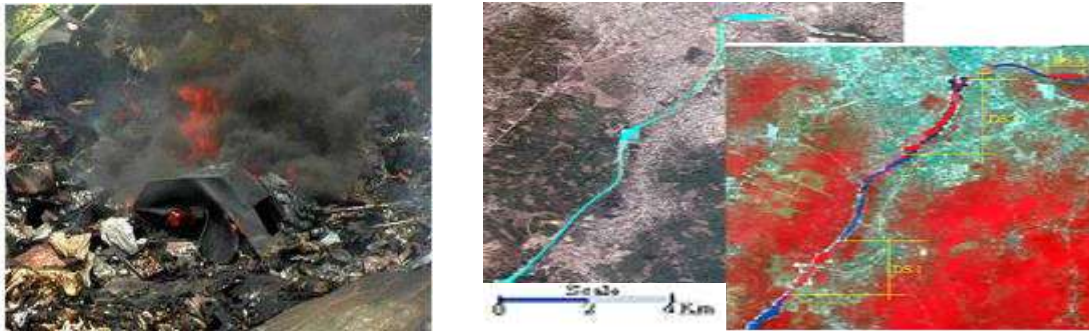


Figure 9b. Waste burning (Otamiri (1980) and (Otamiri 2020) imageries Otamiri River 43% decline between 1980 and 2020 is predominantly due to climate action

Life Below Water

Oil spillages from offshore installations (Fig 10a), trans-boundary waste dumping along the Atlantic coast of West Africa (Fig 10b) and dumping of domestic and hazardous waste in the creeks and along river banks in Nigeria (Fig 10c) are criminal acts that must stop. These criminal acts pollute the water and prevail on the rights of rivers and aquatic organisms. Protect marine and coastal ecosystem; Prevent over-fishing and avoid the use of chemicals in fishing; Insist on storm water management and treatment of industrial wastes waters before discharging such to the water ways. Nigeria is capable of restricting all of the above vices to achieve life below water by 2030 if given due attention.



Figure 10a. NNPC Offshore installations (Nwachukwu et al. 2024), 10b. Atlantic coast of W-Africa, 10c. Otamiri River bank (Nwachukwu and Feng, 2010f)

Life on Land

Abandoned borrow pits, desert encroachment, erosion and waste dumping are all vices of environmental degradation that put stress on land. Terrorism and war

also register adverse effects on land. Improving life on land will include the keeping of biodiversity and maintenance of terrestrial ecosystem. It is possible for Nigeria to have good life on land if the aforementioned vices of land degradation are addressed but this cannot take place by year 2030 as there are no clear strategies mapped out to address the issues, which implies that achievement of SDGs 15 is not feasible in Nigeria by year 2030 in the presence of environmental hazards and insecurity



Figure 11a. Typical Crime Site, Fig 11b. Boko Haram (Nwachukwu 2014a)

Peace Justice and Strong Institutions

Corruption, terrorism, Open grazing, and desert encroachment are typical vices militating against peace and strong institutions in Nigeria. The most crucial is corruption which has embedded deep into the fabrics of society in Nigeria, preventing justice, delaying justice, and purchasing justice. Providing access to justice for all in Nigeria is virtually impossible due to high level of corruption in the judiciary. Peaceful and inclusive societies may not exist in a society where justice is not open and not assessable to all. This implies that Peace, justice and strong institutions would not be achieved in Nigeria by year 2030.

Partnership

The whole ideas of partnership are not guaranteed, as partnership is based on negotiation and not all negotiations work out. The goal of partnership is not holding strong as it is yet a new concept for African nations. It is expected that the idea of partnership in achievement of SDGs should hold strong among African countries but unfortunately, this is not true. A number of proposals have been made in this respect but the workability including funding and language differences are posing more challenges. For example: Nwachukwu *et al.* (2023b) proposed a Geospatial Intelligence Training Concept for Terrorism Surveillance in Sub-Saharan African Countries (Fig 12). This proposal is yet to see the light of commencement due to funding factor and insecurity. This implies that the ideas of partnership will go beyond the year 2030, giving room African nations to recognize the needs.

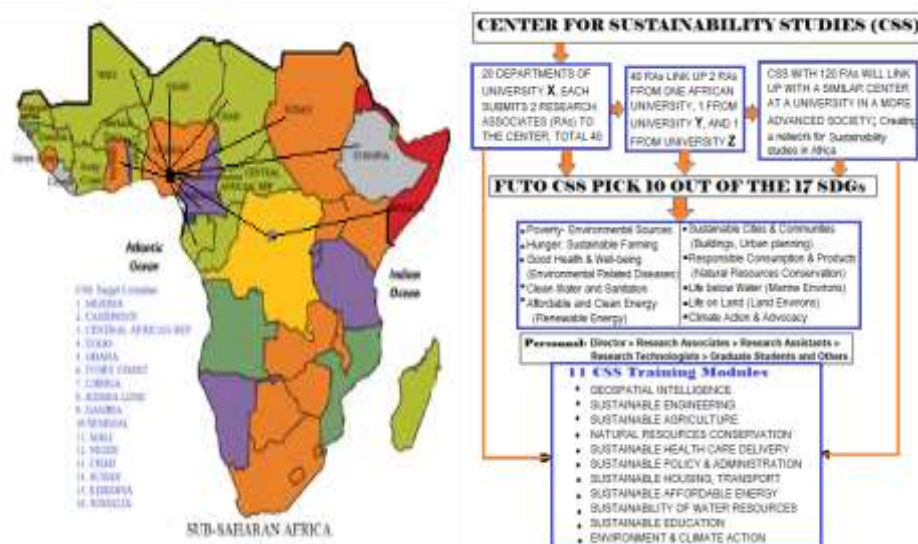


Figure 12. Theoretical Framework of the Partnership proposal

Outcome of assessments

From the above assessment, Nigeria has chances of achieving 4 out of the 17 SDGs by year 2030. The achievable 4 are SDGs 4, 7, 8 and 14. This implies that Nigeria will score 24% compliant to SDGs by year 2030 which is a failure. To improve on this score, it is hereby recommended for Nigeria to set up a common states sustainable development agenda against 2040 as 2030 is already nonrealistic. This domestic agenda called **Agenda 2040** consists of ten environmental pathways that states in Nigeria should embark upon between 2025 and 2040 to achieve SDGs. Without Agenda 2040, SDGs in Nigeria will remain elusive.

Recommendations (Agenda 2040)

1. *Environmental Science and Sustainability Education (ESSE)*

Every State Government in Nigeria, including Abuja should, with immediate effect make Environmental and sustainability science a compulsory subject in schools; from primary to junior and senior secondary. Make Environmental science a WAEC and NECO examinations subject now that universities are turning out environmental scientists who can teach the subject. Make environmental education compulsory at junior secondary. Environmental education should no longer be suppressed, because Environmental education is education for all and education for sustainable development.

2. *Ministry of Environment and Sustainable Development (MESD)*

Every state government in Nigeria, including Abuja and the federal government should with immediate effect, maintain a viable Ministry of Environment and Sustainable Development. Ministry of environment is being suppressed in Nigeria as in budgetary allocation, and often neglected or merged, for example Ministry of Petroleum and Environment, indicating lack of recognition of what environment stands for. This ministry shall have 4 departments:

- Land Contamination/Pollution Monitoring and Prevention Department
- Water Contamination/Pollution Monitoring and Prevention Department;
- Air Contamination/Pollution Monitoring and Prevention Department
- Social and Infrastructural Development Department

3. *State Rail Transport Corporation*

Every state government in Nigeria to embark on the construction of Railway lines joining all major cities or zones in the state and call on the federal government to consider the inter- state rail lines. No country in the world has made progress in development without rail transport. Imo state for example should, with immediate effect award contract for the construction of rail lines joining Owerri to Orlu and Okigwe. This project cannot be put in the cooler, tempting the public to build and encroach onto already mapped rail lines. Nigeria cannot meet up with the UN SDGs without rail transport.

4. *State Water Production and Supply Companies (WPSC)*

State governments should take responsibility of water supply to people of the state. States should create water supply blocks and appoint companies to produce portable water and serve residents in their assigned blocks at a government-regulated rate. No country in the world has made progress in quality of life and livability with every household taking care of their water needs in absence of public water supply and services. Thereafter, all private shallow substandard private water wells producing water of poor quality and point sources of groundwater contamination should be sealed by state. The case of Camp Lejeune is at hand, when in 1953-1978, a United States marine base was established at Lejeune in North Carolina and the people were exposed to contaminated water. Today US government has set aside millions of dollars to support all persons exposed to contaminated water now having different types of cancer. In Nigeria who will take care of people now

exposed to contaminated sachet water called “Pure Water” when the related diseases manifest.

5. Power Generation and Supply Companies (PGSC)

Energy generation and supply shall become the responsibility of state governments through private companies. After 60 years of existence, the national grid has failed to supply the energy need of the country amounting to irregular or no power supply in the country. Severally, we hear about collapse of the national grid causing to a total black-out in the country for weeks. Viable states should consider setting up their energy companies that could use both fossil fuel and other accessible forms of renewable energy. States that have coal reserves could also use coal. Some states that house or close to hydroelectric power stations could continue with hydropower. This is a fundamental issue of sustainable development in Nigeria.

6. Institutes for Policy and Sustainability Studies (IPSS)

Every state government is to establish the institute for policy and sustainability studies (IPSS) attached to the office of the governor now that the whole world is addressing issues of sustainable development. This institute will engage qualified personnel from the academia and the civil society to provide training and orientation to the legislators serving in the state and in the national assembly. The same training will be extended to the state appointed judges, commissioners, permanent secretaries, directors and the private sector chief executives. IPSS is similar to the national institute for policy and strategic studies but has a civil background as against a military background. IPSS is important to lead government functionaries and policy makers into the ideas of SDGs.

7. Mapping of Polluted and Crime Site (MPCS)

Every state in Nigeria including Abuja should map their contaminated and crime sites, discriminating such sites as danger zones for farming and human dwelling. This requires every state to have a security intelligence surveillance team (SIST) whose duty will not only end with the mapping but will monitor activities within and around the mapped areas. SIST as an independent team attached to the office of the governor will monitor food and human security in the target areas, making sure food is not cultivated in polluted land and that such sites are not allowed as hide-outs of criminals including kidnappers and ritualists. Staff of SIST will be trained on digital mapping using drones and equipped with operational tools including for communication and transport. Food security and cases of terrorism must be addressed, if Nigeria must be recovered from the circle of insecurity.

8. Economic and Financial Crime Agency (EFCA)

Operating and controlling the Economic and Financial Crime Commission (EFCC) at the federal level is not enough. Economic and financial crime commission should exist in every state, operating and directed by the state government. Several economic and financial crimes take place in the states on daily bases without being questioned. A public servant who took away 20 million naira from state fund will not spare 20 billion if exposed to federal fund. What about the police officers on the street extorting money from commercial drivers? Sanitizing the society from economic and financial crimes should be bottom-up if Nigerian must be recovered from the present den of polluted society ordinarily called corruption.

9. Sustainable Waste, Drainage and Watershed Management

Establish Secured Landfills or sanitary landfills in urban areas as contained in **Nwachukwu (2016)** for proper waste disposal to protect environments from daily contamination. States should put an end to Open Drainage System in urban areas: Starting 2025, every state in Nigeria including Abuja should adopt sustainable drainage system to improve sanitation and reduce diseases. This implies: Closure of all open drainages to keep a Closed Drainage Network in the cities. This will reduce the prevalence of environmentally related diseases.

10. Sustainable Campus and Sustainable Academics

Now is time for higher education campuses in Nigeria to integrate environmental quality standards and sustainability into its policy, structural developments, management and academics to improve quality of life and reduce untimely death. A sustainable campus therefore integrates the UN SDGs particularly in the areas of quality education, good health and well-being. Mandatory post-doctoral fellowship for young PhD holders is now inevitable as a way of knowledge transfer by professors prior to their retirement or else, teaching and research in Nigeria universities shall be nothing to talk about by year 2040. Post-Doc is sustainable academics that fosters livability to young academics who waste their time seeking post-doc opportunity elsewhere in the world, just to get out of Nigeria. Sustainable academics in Nigeria universities will also include introduction of degree programs in sustainability science. On the side of the civil society, communication of research outcome through public lectures at County headquarters and to stakeholders is inevitable in Nigeria 2025-2040. Since poor environmental quality and unsustainable development are traced to lack of environmental education and knowledge of sustainability, environmental and sustainability awareness public lectures will surely make a difference.

5. CONCLUSION

Exposure to Environmental stress is exposure to poverty. Long exposure to environmental stress is the cause of untimely deaths in Nigeria. Poor environmental quality (PEQ) causes Environmental Stress (ES); ES causes Poor Quality of Life (PQL); PQL accommodates Insecurity, Diseases and Poverty (IDP); IDP is the root cause of Low Livability Index (LLI) in Nigeria. LLI is a critical situation in Nigeria where youths now prefer slavery outside Nigeria than remain in Nigeria due to extreme poverty. The elderly prefer to remain outside Nigeria due to health challenges and lack of medical facilities. The wealthy prefer to live outside Nigeria due to insecurity and every Nigerian wish to leave the country due to environmental stress. To address this ugly situation, Nigeria needs Agenda 2040. Absence of this agenda has placed Nigeria at the bottom of the global sustainable development index after 9 years of UN pronouncement of SDGs. Nigeria will be 24% compliant to SDGs by year 2030. This assessment suggests that Nigerians should put aside political and ethnic divides and follow the provisions of SDGs with Agenda 2040 to achieve a better Nigeria. Citizens should primarily look upon their state governments on how to improve environmental quality to reduce disease burden, rather than look upon the federal government, or contesting non-availability of health care facilities. Agenda 2040 will provide direction for states development and without Agenda 2040 SDGs shall be elusive, and Nigeria will become a deserted nation by year 2040. Nigeria and indeed Africa should not see sustainability or sustainable development like a western ideology whereas the concept is originally embedded in the culture and tradition of Nigeria and other sub-Saharan African countries. African nations only need to achieve sustainable developments goals by themselves, with some level of partnership within and outside Africa.

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