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CLIMATE CHANGE: CAUSES, CONSEQUENCES AND REMEDY IN NIGERIA

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ABSTRACT

Climate change is a general phenomenon that is generating concerns from countries all over the world. This paper centers on the causes, consequences and remedy to climate change in Nigeria and content analysis approach is adopted. Consequently, Carbon Dioxide (CO₂) Emission, Methane, Nitrous Oxide and fluorinated gases are the determinants or causes of climate change in Nigeria. However, these pollutants are in gases form in practices such as gas flaring, oil spillage, bush burning, deforestation, carbon mono-oxide emission by vehicle, burning of fossil by trucks, industries plants, etc. Drought, variability in rainfall, Rise in sea level, rise in the temperature and extreme weather condition has impacted on the country negatively. However, tree planting, reforestation, renewable energy, sustainable transportation and Adoption of climate-adaption crops are the remedy that will mitigate climate change drastically. The government should implement its policy of gas flaring prohibition policy. The federal government should recruit people that will be responsible solely for tree planting. This is pertinent because the Northern Nigeria is prone to desertification, planting trees will reduce the negative impact of climate of change. Pollution Free day should be introduced in Nigeria as we have world car free day on 22 September of every year. If this day is introduced, the populace should be enlightened on the dangers of climate change pollutants and how to curb it.

Keywords: Climate Change, Content Analysis, Carbon-Dioxide Emission, Deforestation.

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INTRODUCTION

Climate change is one of the most serious environmental threats facing mankind worldwide due to its multi-faceted nature. The issue of climate change has become more threatening, not only to the sustainable development of socio-economic and agricultural activities of any nation, but to the totality of human existence. It is an undeniable environmental problem of the 21st century

which the world is currently experiencing and seeking measures to adapt and mitigate its impact. According to the United Nation Framework Convention on Climate Change (UNFCCC), climate change as a change which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere over comparable time periods.

Obviously, Nigeria's climate has been changing, evident in: increases in temperature; variable rainfall; rise in sea level and flooding; drought and desertification; land degradation; more frequent extreme weather events; affected fresh water resources and loss of biodiversity. The durations and intensities of rainfall has increased, producing large runoffs and flooding in many places in Nigeria. Nigeria as a country does not have a uniform climate. Nigeria has a tropical climate with two precipitation regimes: low precipitation in the North and high precipitation in parts of the Southwest and Southeast. (Akande et al., 2017). The Northeast and the Northwest are vulnerable to rising heat, less rain, desert encroachment while loss of the wetlands, fast reduction in the amount of surface water is prominent within South western region. The south-south (Niger Delta region) is the most vulnerable, due to sea level rise, increased precipitation, coastal erosion and flooding which has resulted in the displacement of many settlements (Matemilola, 2019).

CONCEPTUAL CLARIFICATION

Climate Change

Climate change refers to the long time (about 35 years) average weather conditions of a region including typical weather patterns, the frequency and intensity of storms, cold spells and hot weather. The climate is the manifestation of a highly complex system consisting of five interacting components: the atmosphere (air), the hydrosphere (water), cryosphere (frozen part of the earth), the land surface, and the biosphere (part of the earth where life exists). United Nations Framework Convention on Climate Change (UNFCCC, 1992) defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes.

De Chavez and Tauli-Corpus (2008) climate change is the average increase of the earth's surface temperature and oceans as compared to previous centuries. This is a result of the continuous trapping of heat within the earth's atmosphere due to increased quantity of greenhouse gases. Global warming is one of the key aspects of climate change. Global warming can lead to the rise in the sea levels, oceans warm and glaciers melt, thereby threatening agricultural productivity and human settlements. Other impacts may include; changes in rainfall patterns and increase in soil erosion, storms, floods and drought. The ultimate result at the end would be a deepening food crisis, as well as worsening weather, energy decrease and general environmental breakdown throughout the world.

Causes of Climate Change in Nigeria

Basically, Carbon Dioxide (CO₂) emission, Methane, Nitrous Oxide and fluorinated gases are the determinants or causes of climate change in Nigeria, However, these pollutants are in gases form

in practices such as gas flaring, oil spillage, bush burning, deforestation, carbon mono-oxide emission by vehicle, burning of fossil by trucks, industries plants etc.

Carbon Dioxide: Carbon dioxide is a chemical compound composed of one carbon and two oxygen atoms. It is often referred to by its formula CO₂. It is present in the Earth's atmosphere at a low concentration and acts as a greenhouse gas. In its solid state, it is called dry ice. It is a major component of the carbon cycle. CO₂ or carbon dioxide is produced any time something is burned. It is the most common Green House Gas (GHG). It is used as a marker by the United States Environmental Protection Agency (USEPA) for example, because of its ubiquity. Carbon dioxide is assigned a Global Warming Potential of 1. The realization that climate might change, as a result of emission of CO₂ into the atmosphere is not new. Arrhenius (1896) pointed out that burning of fossil fuel might cause an increase of atmospheric CO₂ and thereby changing the heat balance of the earth. Calendar (1938) convincingly showed that the atmospheric CO₂ concentration was increasing. The observation which began in 1958 has clearly shown that the concentration of CO₂ in the atmosphere has increased from about 315ppm to about 343ppm in 1984 (Nyong, 2007). Nigeria's total GHG emissions in 2014 were 492.44 million metric tons of carbon dioxide equivalent (MtCO₂e), totaling 1.01 percent of global GHG emissions World Resources Institute and Climate Analysis Indicators Tool.

Climate change is happening because of us. Human activities are releasing excessive amounts of greenhouse gases into our atmosphere. As a result, the globe is already one degree warmer on average than it was before the Industrial Revolution. As concentrations of greenhouse gases have increased, the Earth has warmed. Between 1906-2005, the average global temperature rose by 0.74°C, with most of that warming occurring since 1970. By 2015, the average global temperature had warmed by over 1°C since pre-industrial times. Sixteen of the 17 warmest years on record have been in 21st century (Lindsey & Dahlman, 2021). This warming is not the same everywhere. Some areas with crucial ecological importance - like around the poles - are warming at two or three times the global average. Today's Nigeria have built its economies on burning fossil fuels to provide electricity, transport and to develop industries. Nigeria was the world's 17th largest emitter of greenhouse gases in 2015. It is Africa's largest oil producer and the world's ninth largest exporter. It is expected to overtake China to become the world's second most populous country by the end of the century. In 2019, CO₂ emissions for Nigeria was 100.2 million tonnes. Though Nigeria CO₂ emissions fluctuated substantially in recent years, it tended to increase through 1970 - 2019 period ending at 100.2 million tonnes (2.61 %) in 2019.

Table 1: Nigeria CO₂ emissions, 2008-2019

Date	Value	Change, %
2019	100.2	2.61 %
2018	97.7	3.75 %
2017	94.1	3.66 %
2016	90.8	1.55 %
2015	89.4	4.35 %
2014	85.7	-4.54 %
2013	89.8	-0.92 %
2012	90.6	-4.80 %
2011	95.2	5.15 %
2010	90.5	15.98 %
2009	78.0	-11.83 %
2008	88.5	

Source: <https://knoema.com/atlas/Nigeria/CO2-emissions-per-capita>

Gas Flaring: Gas flaring is defined as the controlled burning of natural gas that cannot be processed for sale or use because of technical or economic reasons Canadian Association of Petroleum Producers, Flaring & venting, (CAPPFV, 2012). Gas flaring can also be defined by the combustion devices designed to safely and efficiently destroy waste gases generated in a plant during normal operation. It is coming from different sources such as associated gas, gas plants, well-tests and other places. It is collected in piping headers and delivered to a flare system for safe disposal. Gas flaring refers to the combustion of associated gas generated during various processes including oil and gas recovery, Coal Bed Methane (CBM), petrochemical process and landfill gas extraction. A gas flare, alternatively known as a flare stack, flare boom, ground flare, or flare pit is a gas combustion device used in industrial plants such as petroleum refineries, chemical plants and natural gas processing plants. In industrial plants, flare stacks are primarily used for burning off flammable gas released by safety valves during unplanned overpressuring of plant equipment. During plant or partial plant startups and shutdowns, they are also often used for the planned combustion of gases over relatively short periods (Emam, 2015).

At oil and gas extraction sites, gas flares are similarly used for a variety of startup, maintenance, testing, safety, and emergency purposes. In a practice known as production flaring, they may also be used to dispose of large amounts of unwanted associated petroleum gas, possibly throughout the life of an oil well (International Petroleum Industry Environmental Conservation Association [IPIECA], 2019). Obviously, according to the World Bank's Global Gas Flaring Reduction Partnership has reported that Nigeria is the 7th highest gas flaring country in the world. About 800 million standard cubic feet (Mmscf) of gas is flared every day from approximately 144 gas flare points across Nigeria. In conformity, the Nigeria National Petroleum Corporation (NNPC) stated in its Monthly Financial and Operations Report for November 2017 that oil companies operating in the country flared a total of 301.69 billion standard cubic feet of gas between November 2016 and November 2017. Using the exchange rate of N360 to a dollar and the Domestic Supply Obligation (DSO) price of \$1.50 per 1,000 Standard Cubic Feet (SCF) of gas, this translates to a loss of N162.912 billion.

In Nigeria, oil companies flare over 313 million standard cubic feet of gas annually, according to satellite data estimates from Nigeria's environment ministry. The flared gas in turn results in the emission of 16.5 million tonnes of carbon dioxide. In a bid to drastically cut down gas flaring and convert flared gas to economic use, the Federal Government of Nigeria (FGN) has launched the Nigerian Gas Flare Commercialization Programme (NGFCP). Since the start of commercial oil production in the country, the flaring of associated gas has become commonplace in Nigeria. This is because oil producers do not derive sufficient economic benefits from the utilization or production of associated gas.

Despite recent efforts by the FGN to encourage the utilization of natural gas for power generation and industrialization, the World Bank's Global Gas Flaring Reduction Partnership has reported that Nigeria is the 7th highest gas flaring country in the world. About 800 million standard cubic feet (Mmscf) of gas is flared every day from approximately 144 gas flare points across Nigeria. Furthermore, the Nigeria National Petroleum Corporation (NNPC) stated in its Monthly Financial and Operations Report for November 2017 that oil companies operating in the country flared a total of 301.69 billion standard cubic feet of gas between November 2016 and November 2017. Using the exchange rate of N360 to a dollar and the Domestic Supply Obligation (DSO) price of \$1.50 per 1,000 Standard Cubic Feet (SCF) of gas, this translates to a loss of N162.912 billion. The gas currently flared is estimated at two billion cubic feet per day

(scf/d) or 56,600 m³, the highest in any member nation of OPEC (Ageh in Raimi et al., 2013).). The quantity of gas flared in Nigeria is equivalent to the total annual power generation in the sub-Saharan Africa 'according to World Bank (Abdulkareem et al., 2012). Gas flaring has been illegal in Nigeria since 1984, yet the country still ranks among the top 10 gas-flare countries with about 7.4 billion cubic meters of gas flared in 2018; and about 425.9 billion standard cubic feet of gas flared in 2019 (Eboh, 2019). Gas flaring is associated with lots of dangers.

Bush Burning: Bush burning is one of the major air pollutants that are emitted during bushfire and these include Carbon monoxide, Carbon dioxide, oxides of Nitrogen, oxides of Sulphur, particulates and Hydrocarbon as a result of incomplete combustion of cellulose materials (Stern, 1976). These do not only pose health hazards to man alone but also affect the environment in general. Oxides of Sulphur and nitrogen remain hazardous and causes respiratory disorder characterized by excessive mucus secretion in the bronchial tubes. Apart from soil destruction and desert encroachment caused by the effect of bush burning, it also has a marked increase in global warming due to the emission of NO₂, SO₂, SO₃, NO, CO and CO₂ gases which have tremendous effect on the Ozone layer. There is also the formation of acid rain which deteriorates plants, damages Calcium in soils and also increases acidity of the surrounding lakes, rivers and soils (Neina, 2019).

In a previous study conducted (Edwin, 2006) observed that rampant bushfires cause significant damage in all the ecological zones, and is most pronounced where the savanna vegetation predominates and the incidence also remain the highest. More than half of bush burning throughout Nigeria is deliberately lit, costing millions of naira damages annually. The questions which need answers are, what motivates an arsonist and what do they feel when the bush is burning? This feature proffers solutions to the problems. The negative impact of bush burning need not to be over emphasized especially during the hot season in northern Nigeria as apart from environmental pollution and health hazards, bush burning obviously causes immense catastrophes in many quarters. They include bush burning as public nuisance, the suffocating experience felt by people due to the huge smoke soaring in the air during the heat, and the pollution of the ozone layer of the environment. In this regard, the menace is of double tragedy in the sense that while the heat is unbearable, bush burning fires also heat up the soil thereby blazing up its nutrients including the fertilizer elements.

Oil spillage: The effects of oil spillage have wide ranging impacts that can be regarded as long-lasting environmental disasters. Oil spillage has a major impact on the ecosystem into which it is released and may constitute ecocide (Okon, 2017). Immense tracts of the mangrove forests which are especially susceptible to oil spillage have been destroyed. An estimated 5 to 10% of Nigerian mangrove ecosystems have been wiped out either by oil spillage (Michael in Onyena & Sam, 2020). Obviously, the predominant mangrove vegetation is adversely affected by spills, as the leaves are unable to breathe, causing the plants to dry up. A point to understand is that crude oil should never be found on the surface; that is why it is got from beneath the earth, but when it spills either due to equipment failure or sabotage, it kills the plants whose major responsibility is to absorb the carbon dioxide emission which help to mitigate climate change.

Deforestation: Deforestation is the removal of a forest or stand of trees where the land is thereafter converted to a non-forestry use. It also refers to indiscriminate cutting or over-harvesting of trees for fuel wood, commercial activities, charcoal making, pulp, or to clear the

land for agriculture, ranching, logging, construction, or development activities such as construction of railway, highway, dam, industries, mining and alike (Ojekunle, 2014). Deforestation can also be defined as the loss of vegetation or the selective exploitation of forests for specific or group of the first species for economic or social reasons (FAO 2008). Deforestation is ubiquitous in Nigeria, mostly on the loss of vegetation, loss of forest diversity. It is a continuous activity which accounts for vegetation degradation, loss of wildlife, plants and relative habitats. The Food and Agriculture Organization of the United Nations says that deforestation is the second-leading cause of climate change. (The first is the burning of fossil fuels.) In fact, deforestation accounts for nearly 20% of greenhouse gas emissions. When Nigeria gained her Independence (1960) and became a sovereign state, she inherited eight (8) national parks, four hundred and forty-five (445) forest reserves, twelve (12) strictly nature reserves and twenty-eight (28) game reserves from the colonial administrators for the protection and conservation of the forest biodiversity in the country.

Unfortunately, these vast areas reserved in 1950s no longer exist. This legacy has been greatly destroyed, the protected areas has been deforested, degraded, encroached on and converted for other land uses. Globally, forests still cover about 30 percent of the world's land area, but they are disappearing at an alarming rate. Between 1990 and 2016, the world lost 502,000 square miles (1.3 million square kilometers) of forest, according to the World Bank an area larger than South Africa. Since humans started cutting down forests, 46 percent of trees have been felled, according to a 2015 study in the journal Nature. About 17 of the Amazonian rainforest has been destroyed over the past 50 years, and losses recently have been on the rise. Forests are important as storage of carbon, for production of oxygen vital for human existence on earth. They also help in regulation of the hydrological cycle, purify water, provide wildlife habitats, and they help in reducing global warming, as well as absorbing toxic gases, contain pollution and above all conserve soil. Consequently, deforestation result to climate change, cutting trees both adds carbon dioxide to the air and removes the ability to absorb existing carbon dioxide. If tropical deforestation were a country, according to the World Resources Institute, it would rank third in carbon dioxide-equivalent emissions, behind China and the United State.

Transportation: Greenhouse gas emissions from the conventional energy sources used for transportation are known to be the main reason for the global warming which started changing the climates and posing serious threat to the planet and has now become very crucial to find new ways of integrating sustainable energy in the strategic implementation of the automotive infrastructure development plans. Carbon dioxide (CO₂) emissions from transport in Nigeria was 35.39% in 2014 according to Intercontinental Panel on Climate Change (IPCC Source). CO₂ emissions from transport contains emissions from the combustion of fuel for all transport activity, regardless of the sector, except for international marine bunkers and international aviation (EPA, 2020). This includes domestic aviation, domestic navigation, road, rail and pipeline transport, etc.

Consequences of Climate Change in Nigeria

The country's economy is closely tied to oil and gas exports. Profits from petroleum exports currently account for 86% of Nigeria's total export revenue. The production of oil and gas in Nigeria has also been linked to steep societal inequalities and environmental disasters. Nigeria has one of the highest rates of energy poverty in the world and suffers from chronic power cuts. In its recent Covid-19 economic recovery plan, the government pledged to fix its worsening energy crisis through the rapid expansion of solar power. In a shock move, it also scrapped fossil fuel subsidies. Climate change is having a large impact on Nigeria. Sharp increases in extreme heat are affecting the many millions of people without access to air conditioning or electricity and changes to precipitation threaten Nigeria's largely rain-fed agricultural sector. Some suggest that climate change could fuel the risk of conflict in the north of the country (Dunne in Hussona, 2021). Africa, especially Nigeria is the most hit by climate change effects ranging from floods to droughts down to heatwave leading to loss of lives and livelihoods (Ajetomobi, 2015).

Rise in sea level: There is a general concern that global temperatures and sea levels are rising and will continue to do so throughout the 21st century (Trenberth, 2008) and Nigeria is not an exception. Globally, sea levels rose in the last century and various projections suggest substantial increases this century due to climate change. In Nigeria, there is no up-to-date sea level rise (SLR) assessment for the coast. Much of the Nigerian coast is low-lying with the consequence that a one to three meters rise in sea level, which may result from ecstatic. Climate change will have a catastrophic effect on human activities in this region due to sea level rise. The report from the Intergovernmental Panel on Climate Change a gold standard of scientific research, outlined the threat to hundreds of millions of people from the acceleration in the rate at which sea levels are rising, caused by a combination of melting ice in polar regions such as Greenland and Antarctica and the expansion of the oceans as the water warms.

Flooding: In late August 2012, Nigeria was hit by the worst flooding ever experienced in 40 years. This affected 7 million people in communities across 33 states including Kogi state. More than 2 million people out of the affected 7 million were driven from their homes by rising waters Red Cross braces for flooding in Nigeria (IFRC 2020)". Also, the country experienced another flooding caused by heavy seasonal rains in 2013 which brought further misery to a population that was still recovering from the 2012 fatal floods. Many mud-brick homes collapsed and families' belongings were ruined. Dug wells which are sources of potable water were also polluted. The states of Abia, Bauchi, Benue, Jigawa, Kebbi, Kano, Kogi and Zamfara were most affected by the floodwaters which lasted for 48 hours. The situation in Kaduna and Katsina was aggravated by the collapse of earth dams. According to the National Emergency Management Agency, more than 47,000 people were affected. This lesser number of people affected is attributed to the lessons of the 2012 floods which prepared the country for a better response Inform Red Cross (IFRC, 2020). Climate change was the reason behind the flood that took place in Southern Nigeria in 2012. The flood was responsible for the loss of houses, farms, farm produce, properties and lives. According to statistics released in 2014 by National Emergency Management Agency (NEMA), about 5,000 houses and 60 homes were affected in a windstorm that occurred in four states in the south west region (Jumoke, 2016).

Variation in rainfall: In 2001, rainfall index for Nigeria was 1,295 mm. Though Nigeria rainfall index fluctuated substantially in recent years, it tended to decrease through 1970 - 2001 period

ending at 1,295 mm in 2001. Climate change is expected to continue to increase rainfall variability, with an increase in precipitation by approximately 5-20 percent, and subsequent flooding, in some humid areas of the forest regions and savanna areas in southern Nigeria (Olapido, 2010). Floods near the coast in southern Nigeria will be exacerbated by rising sea level (Akande, 2017). Low prediction estimates are for a rise in average sea levels of 0.1m and 0.2m by 2020 and 2050 respectively, due to climate change. Higher estimates are 0.3m by 2020 and 1m by 2050.

Rise in temperature: Climate projections for the coming decades reveal a significant increase in temperature over all the ecological zones Akande (2017). It is predicted that there will be a temperature increase of 0.4 to 1°C over the time period 2020-2050 due to climate change, and an increase of up to 3.2°C by 2050 under a high climate change scenario (Olapido, 2010). Regional variations are expected, with the highest increase (4.5°C by 2081-2100) projected in the Northeast (BNRCC, 2011). In Nigeria, rising average temperatures as a result of climate change have been shown to be already affecting the environment and livelihood assets (Ishaya & Abaje, 2009). Temperature increases of about 0.2–0.3°C per decade have been observed in the various ecological zones of Nigeria (Federal Republic of Nigeria (FRN), 2003). Precipitation increases of about 2-3% for each degree of global warming may be expected for the tropical humid zones (FRN, 2014; Oladipo, 2011). In the northern part, annual rainfall amounts have been on the increase especially from the late 1990s (Abaje et al., 2013).

Drought: Drought is a naturally occurring phenomenon that exists when precipitation becomes significantly below normal recorded levels, causing serious hydrological imbalance that adversely affects land resources for production systems. In Nigeria, drought is a phenomenon that affects the entire country. However, the degree of vulnerability differs, with the arid and semiarid regions being more vulnerable than the more humid south. Droughts have impacted negatively in Nigeria and are expected to continue in Northern Nigeria, arising from a decline in precipitation and rise in temperature. Lake Chad and other lakes in the country are drying up and at risk of disappearing. The underlying causes of most droughts in Nigeria can be related to climate change and changing weather patterns manifested through the excessive buildup of heat on the earth's surface, meteorological changes which result in a reduction of rainfall, and reduced cloud. The resultant effects of drought are exacerbated by human activities such as deforestation, bush burning, overgrazing and poor cropping methods, which reduce water retention of the soil, and improper soil conservation techniques, which lead to soil degradation.

Remedy to Climate Change in Nigeria

Tree planting and reforestation: Trees have the capacity to store large amounts of carbon thereby making them one of the cheapest solutions to mitigating Climate Change. More than 70 percent of the people living in rural areas in Nigeria use fuel wood, which has been a key contributor to deforestation. However, reforestation is only about 10 percent of the deforestation rate (Elum & Momodu, 2017). There is an urgent need for a more aggressive tree planting. In a bid to encourage tree planting, the Nigeria Conservation Foundation (NCF) in collaboration with the Lekki Urban Forest Animal Sanctuary Initiative (LUFASI) as part of the Nigerian Governments Green Recovery Nigeria program, 2020. This partnership involved the facilitation of planting native tree species at the Federal University of Agriculture (FUNAAB), Abeokuta in Ogun State, Nigeria and in other places in the country.

Renewable/Clean Energy: The first way to prevent climate change is to move away from fossil fuels. What are the alternatives? Renewable energies like solar, wind, biomass and geothermal. It is important to control CO₂ emission and other associated greenhouse gases by moving towards renewable energy development and an energy efficiency mechanism in Nigeria (Yahaya & Nwabuogo, 2016). Nigeria has abundant sources of renewable energy but lacks the adequate government backing to harness these resources for electricity power (Akuru & Mshelia, 2016). Despite movement toward the development of policy and legislation in support of renewable energy, in particular the Renewable Energy Master Plan (REMP) developed in 2006 and updated in 2011, there has been limited progress in implementation. In addition, fossil fuels in Nigeria have benefited more from subsidies and incentives than the renewable energy industry (Elum & Momodu, 2017). There are few existing renewable energy projects in Nigeria. In order for Nigeria to provide energy for its entire population while limiting greenhouse gas emissions, all forms of renewable energies needs to be exploited (Dioha & Emodi, 2018). These include solar power, tidal, ocean energy, geothermal power, and wind power; nuclear power, the use of carbon sinks, and carbon capture and storage (Yahaya & Nwabuogo, 2016). Currently, the vast majority of renewable energy consumption is derived from hydropower (Achike, 2019). The development of solar energy which is the most available form of renewable energy in Nigeria is relatively new to the country and should be encouraged.

Sustainable transportation: Promoting public transportation, carpooling, but also electric and hydrogen mobility, can definitely help reduce CO₂ emissions and thus fight global warming. There are more than one billion cars on the road today, a major source of emissions. Shifting cars from “gas to grid” that is, to electricity as their fuel can make mobility dramatically more sustainable and reduce harmful air pollution. Of course, where that electricity comes from matters. All electric vehicles (EVs) have an emissions advantage, but those powered by renewables are the real solution, with 95 percent lower emissions than standard cars.

Sustainable agriculture & forest management: Encouraging better use of natural resources, stopping massive deforestation as well as making agriculture greener and more efficient should also be a priority. The first forest reserve in Nigeria was created in 1901, with the promulgation of the Forestry Ordinance and creation of a Forestry Department ran by Conservators of forests. Under most of the forestry laws and edicts, the Federal and State governments are empowered to declare and protect the resources of forest estates from illegal exploitation. Ironically, the forest reserves have been neglected and the locals have taken advantage of harnessing the forest for personal gains undermining the significant role it plays in mitigating the impact on climate change. However, the forest reserves should be protected in order to remedy climate change in Nigeria.

Walkable Cities: Walkable cities prioritize two feet over four wheels through careful planning and design. They minimize the need to use a car and make the choice to forego driving desirable, which can reduce greenhouse gas emissions. According to the Urban Land Institute, in more compact places ideal for walking, people drive 20 to 40 percent less. Since climate change is a product of machines emission, walkable cities will help mitigate climate change.

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