



**The Challenges of Climate Change in National Development**  
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## **CLIMATE ADAPTATION STRATEGY IN NIGERIA: PERCEPTIONS ON THE USE OF ALTERNATIVE COOKING SOURCES**

**Ibrahim Babagana Usman**

*Centre for the Study and Promotion of Cultural Sustainability, University of Maiduguri, Maiduguri,  
Borno State, Nigeria*

E-mail: [usmanibrahimbbg@unimaid.edu.ng](mailto:usmanibrahimbbg@unimaid.edu.ng)

### **Abstract**

*Nigeria is the most populated sub-Saharan African country with an estimated population of about 200 million people. Despite having abundant energy sources, it is estimated that more than half of Nigerians do not have access to electricity, while those that have often struggle with the unstable nature of power. This paper focused on the perceptions of Nigerians on the use of alternative energy-efficient sources as against traditional energy sources like charcoal and wood fuel in households. The paper gave an overview of Nigeria's climate change adaptation policy and connects it to the literacy level of Nigerians on issues of climate change adaptation through the use of low carbon emission cooking sources. The discourse on climate change has taken centre stage globally as heads of governments seek solutions to its impacts which can be seen all around us. Nigeria has had its fair share of the impacts of climate change ranging from flooding, desertification, and drought amongst others. The Nigerian government has had to come up with certain measures in the form of adaptation policies to neutralise the impacts of climate change. The paper relied on secondary sources for its analysis. Findings from reviewed literature show that the majority of the Nigerian populace, especially in the rural areas, rely heavily on the use of biomass in the form of firewood and charcoals for cooking due to cultural reasons, and in some cases ignorance of the impacts. The overreliance on these energy sources for cooking is not only increasing carbon emissions but posing great danger to the health of people. It is also leading to deforestation. The study also found that despite the grave consequences of climate change, the majority of people have very limited knowledge about the existing adaptation policies put in place. In some areas where alternative cooking energy sources such as briquettes have been introduced, the adaptation success rate appears to be very poor. There is, therefore, the need for a robust bottom-top adaptation policy formulation and implementation that factors in people's cultures, and contexts as it relates to energy sources for cooking that are climate-friendly.*

**Keywords:** Adaptation Policy, Alternative Energy, Climate Adaptation, Climate Change

## **INTRODUCTION**

Historically, scholars including Paleontologists and archaeologists have investigated the precise significance of climatic change in the path of human evolution. For example, Fagan (2009) comments that the changing Ice Age posed huge challenges as well as opportunities for the Pleistocene world's population and animals. When the Ice Age began, the only humans on the earth were ape-like hominins. They walked upright, made and used tools, foraging in small groups, and were well adapted to cooler, drier climates. The adaptation strategies adopted in terms of cooking differ from one civilisation to the other. However, studies have shown that traditional biomass energy has been the dominant source of renewable energy in Africa for decades, despite the rapid expansion of 'improved' clean cooking stoves and compact solar panels in recent years (Mamuye and Teshale 2018; Jurisoo and Lambe 2016). On the other hand, the objective as agreed in several climate change frameworks globally is to promote the use of clean technologies powered by renewable energy to help reduce pollution. Evidence suggests that the use of cleaner energy in households helps to reduce high levels of poverty due to lower costs (Basil et al., 2018). In the context of this paper, the understanding of Kachapulula-Mudenda et al. (2018) and Alhola et al. (2014) of alternative cooking sources as household cooking that minimizes hazardous gas emissions and uses renewable energy is adopted. The transition to renewable energy-based clean stoves is delayed in Africa because people, particularly in rural areas, find it difficult to abandon their traditional wood-burning stoves.

The current state of research shows that climate change affects the global south more than it does the global north. Many of the effects of climate change are already being felt at the current level of warming of 1.2 degrees Celsius (2.2 degrees Fahrenheit). For instance, increased warming, according to Richard et al. (2021), will amplify these impacts and may result in tipping points, such as the melting of the Greenland ice sheet. In 2015, countries including Nigeria committed to limiting global warming "well below 2 degrees Celsius." Even with the Paris Agreement's pledges, global warming would still be roughly 2.7 degrees Celsius (4.9 degrees Fahrenheit) by the end of the century (UN, 2021). Electricity must be generated from low-carbon sources rather than fossil fuels to reduce emissions. This includes retiring coal and natural gas-fired power facilities, significantly increasing the use of wind, solar, and other sources of renewable energy, and reducing energy consumption (Pathak et al., 2022).

Furthermore, climate change manifests differently in different parts of the world, which should ideally inform context-specific adaptation and mitigation policies. Flooding, desertification, deforestation, and drought are all important climate change crises in Nigeria. The main reason for deforestation in Nigeria, particularly in rural regions, is that it is traditionally utilized to produce firewood and charcoal for cooking and other associated activities. Traditional cooking habits significantly add to the amount of carbon emissions into the atmosphere. This is supported by the research of Karanja and Gasparatos (2019), who contend that conventional and inefficient cooking practices might have serious environmental consequences, mostly due to ecosystem degradation and greenhouse gas (GHG) emissions.

Several other studies have also shown that the use of traditional cooking systems poses a health risk to practitioners. For instance, a WHO (2021) report in Nigeria states that smoke from the use of firewood affects users' lungs and can cause heart and respiratory illnesses when they inhale it. The smoke particles are still being released into the atmosphere and breathed by individuals while being deposited in the ozone layer. A number of the Sustainable Development Goals, particularly SDG3 (Good Health and Well-Being, SDG 7 - Affordable and Clean Energy, SDG 11 - Sustainable Cities and Communities, and SDG 13 - Climate Action) are violated by this air pollution, which is caused by

the ongoing use of firewood and other solid fuel. In a similar vein, Adedigba (2019) asserts that even though Nigeria joined the Paris Agreement on Climate Change in 2017, the country is still grappling with the issue of women and children suffering as a result of the frequent usage of firewood and charcoal. He further specified that even in the Federal Capital Territory, Nigeria's seat of power, women in many areas continue to cook with firewood, exhibiting the same symptoms of chest pain, tearful eyes, headache, continuous cough, and back pain that are linked with solid fuel cooking. In another vein, literature has also shown that it is almost impossible to substitute traditional cooking methods (wood charcoal and firewood) considering the economic and cultural factors responsible for the sustenance of this practice. Energy efficient low carbon carbon-emission cooking alternatives like the use of briquettes and clean energy stoves have not been well received especially by rural dwellers in many parts of Africa including Nigeria. Obi et al., (2022) state that biomass energy has the potential to be the main resource for meeting the demand for energy for rural heating in the majority of developing nations. However, it is only sometimes used in many of these wealthy nations (Ericsson and Werner, 2016). The majority of the heating needs of rural residents are met by the direct combustion of wood and other loose biomass in three-stone fires and other inefficient stoves. The lack of specified biomass supply chain structures in both agriculture and forestry-related enterprises may be a constraint on briquette production and consumption (Liu et al., 2020). The acceptability of briquettes in urban and rural regions may also be constrained by the lack of government-backed policies (Nguyen et al., 2021). The implication of this is that any climate change adaptation policy or initiative that does not consider the indigenous knowledge or perceptions of the people may not see the light of day.

### **Climate and Adaptation Policy Framework in Nigeria**

The scientific community did not agree until the 1970s that not only is the climate changing but that humans are the cause of it and that the effects will be mostly detrimental to the ecosystem on a worldwide scale (IPCC, 2017). As a result, to people who have been exposed to the scientific debate, the term "climate change" is conventional. Most people throughout the world are exposed to the concept of global climate change through media, NGOs, or formal education, and the phrase has been translated into most world languages. Millions of dollars are spent yearly by the UN alone to further "educate" people about climate change (IPCC, 2017). Its expenses in 2019 were projected to be around \$9.6 million. In addition, according to Ray and Pugliese (2011), around half of the world's population recognizes human activity as a cause of climate change.

Nigeria's 2021 Climate Change Act offers an ambitious framework for mainstreaming climate efforts in line with national development ambitions, with a net-zero goal for 2050–2070. The Act mandates that the Ministry of Environment create a carbon budget, maintain a maximum average annual global temperature increase of 2 degrees Celsius, and pursue efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels to codify national climate action. Additionally, it mandates the development of a National Climate Change Action Plan every five years to ensure that the nation's emission profile complies with the carbon budget's goals and to outline strategies for both climate change adaptation and mitigation.

The Act requires that all organizations, whether public or private, operating within Nigeria's territorial authority implement policies intended to advance a society that is resilient to climate change, environmentally sustainable, and produces little carbon emissions. According to the Act, every private company with 50 or more employees must appoint a climate change officer who will be in charge of submitting yearly reports to the National Climate Change Secretariats detailing the company's

progress toward realizing its carbon emission reduction and climate adaptation plan as well as putting policies into place to achieve the annual carbon emission reduction targets by the Action Plan.

The Act also establishes the National Council on Climate Change, which will be presided over by the President of Nigeria and will be made up of representatives from the public and private sectors as well as from the non-governmental sector and the female, youth, and disabled populations. The recently established Climate Change Fund, raising funds to promote climate action, and collaborating with the Nigerian Sovereign Green Bond to achieve Nigeria's NDC are all given to the Council with significant authority. It also enables the Council to plan national climate-related initiatives. The Climate Change Fund is meant to provide a source of funding for climate activities that are of the utmost importance. The promotion and application of nature-based methods for reducing greenhouse gas emissions and halting climate change are advised. The Secretariat's duties are to collaborate with civil society organizations, advance climate education, report to the National Legislative Assembly every year on the status of the country's climate change efforts, and assess reports on the fulfilment of climate change responsibilities by Nigerian public and private entities to enable legislative oversight. By the Act, ministries, divisions, and agencies must designate desk officers to oversee adherence to the National Climate Change Action Plan. The Council also has the authority to impose climate action-related duties on both public and private organizations.

The United Nations (UN) Sustainable Development Goals (SDG) specifically dedicated to environmental sustainability in the form of climate change action (SDG 13) also outlines actions that countries must take to mitigate and adapt to climate change to have a sustainable future. In Nigeria, climate change adaptation in recent times is emerging as an important area for action with the potential to improve livelihoods and health while also building resilient communities (Butu et. al. 2022). Nigeria's updated Nationally Determined Contributions 2021 (NDCs), the 2021 Climate Change Act, the National Climate Change Policy, the National Adaptation Plan (NAP), the Long-Term Vision (LTV), the Medium-Term National Development Plan (MTNDP), the Biennial Update Report (BUR), and other national and sub-national plans are the notable Nigerian adaptation policies, laws, frameworks, and strategies in place. Nigeria, a signatory to the Paris Climate Change Pact revised her National Climate Change Policy (NCCP) in June 2021, sets a vision to be a low-carbon, climate-resilient Nigeria and a mission to ensure sustainable development and a climate-proofed economy through multi-stakeholder engagement (Usen, 2022). The national climate change policy further recognises tackling climate change at a multi-sectoral level; agriculture, forestry, energy, water, transport, industry, health, ICT, and security. The Nigerian National Action Plan to reduce Short-Lived Climate Pollutants (SLCPs) in 2018 was an attempt to document major sources of SLCPs and come up with mitigation strategies and implementation pathways for the reduction of emissions within the Nigerian border. The policy also recognized mainstreaming initiatives such as gender and social inclusion and proposes to empower women, children and youth to be response-ready against the effects of climate change.

Furthermore, in August 2022, Nigeria released its Energy Transition Plan (ETP) to achieve the 2060 net zero emissions target that President Buhari announced at COP26. However, the plan relies on significant action after 2030. The government has declared the period to 2030 the "Decade of Gas". Data from the Climate Action Tracker (2022) shows that while Nigeria's policies and actions are consistent with a fair contribution to climate action, they do not put Nigeria on track to meet either of its targets. These policies are also inconsistent with the level of emissions cuts needed to limit warming to 1.5°C. Implementation of the ETP, reflected in the planned policies scenario, would put Nigeria on track to meet its unconditional target, but not its conditional target. Nigeria will need to implement additional policies with its resources to meet its unconditional target, but will also need

international support to implement policies in line with full decarbonisation to meet and exceed its conditional target.

While the Nigerian government has developed a NAP framework, no record has been made of how it is used and implemented to reduce vulnerability at the community level. Also, not much was said about how cooking methods of rural communities and households were considered while coming up with adaptation strategies that are energy efficient with less carbon emission.

## **LITERATURE REVIEW**

In Sub-Saharan African (SSA) countries including Nigeria, there is no sign of diminishing demand for charcoal and firewood (Iiyama et. al, 2014). The main reason for the consistent increase in demand is that apart from being cheap energy for limited-income communities, the business of charcoal and firewood employs a good number of youths in the regions. According to the World Bank, household energy consumption pattern in sub-Saharan Africa dominates the world's total with about 80% dependence on traditional biomass (IEA, 2018). The situation is not much different in Nigeria where traditional energy sources account for about 72% of household energy supply (Chidiebere-Mark, 2018; Maduekwe, 2014). While rural households rely more on biomass fuels than those in urban areas, a substantial number of urban households in Nigeria still rely on traditional energy sources such as fuelwood for their daily energy requirements for cooking (Adamu et al, 2020). Firewood can be consumed without stoves because basic materials like bricks and/or stones are adequate to balance the cooking utensils, especially in rural areas, and the technologies that support their consumption, like traditional charcoal stoves, are widely available. Firewood and charcoal are typically inexpensive, and the technologies that support their consumption, like these stoves, are also highly accessible. Additionally, charcoal's positive relationship with food flavour has maintained its appeal in households, such as for barbecues, and in eateries all over the world. Customers might prefer using biomass fuels even when modern fuels are affordable if they are still reasonably priced. A smooth transition to contemporary energy sources will be significantly hampered by the perception in underdeveloped cultures that biomass is frequently free and easily accessible. Even when buying traditional biomass fuel, it will probably be less expensive than the least expensive clean alternative fuel. Just as crucial as the price of fuels is the price of the fuel combustion machinery. Many consumers may be discouraged from transitioning away from biomass due to the initial cost of purchasing low-emission burners like LPG stoves and LPG bottles. Sometimes, cultural customs override economic considerations and fuel availability to determine the fuel of choice. For instance, according to the IEA (2006), even wealthy households maintain a biomass stove for cooking speciality traditional foods.

In a similar line, it is not widely known that wood charcoal, a common energy source for cooking, is also one of the commodities with the highest level of complexity in today's international trade (Nabukalu et al., 2021). Since its supply chain is obscure, most consumers and regulators find it challenging to determine where the charcoal is coming from and how it is created. Due to the use of informal methods, there is relatively little documentation regarding the charcoal trade. Some dealers continue to nebulously evaluate and categorize charcoal as a "wood product" or an "article of wood," further misrepresenting its true nature and function as an energy source. Because charcoal is made from trees, the environmental community should concentrate on the negative effects of its crude manufacturing practices on biodiversity, especially in tropical regions but also in semiarid areas. Global charcoal production has increased, from 30 million metric tons (Mt) in 1993 to 54 Mt in 2019,

and it is widely available in markets. The Food and Agriculture Organization (FAO) of the United Nations reveals that more than 20,000 tree species were identified by the International Union for Conservation of Nature (IUCN) as endangered and vulnerable in a report on the condition of the world's forests. The main causes of forest degradation are the pursuit of charcoal and firewood in sub-Saharan Africa and logging in sub-tropical Asia and Latin America. Forest-based fuels have long played a significant role in the world's energy supply, and in sub-Saharan Africa, their demand and consumption far outpace those of modern energy alternatives because they are often used alongside electricity and gas, depending on variables like the erratic electricity supply.

The majority of tree species can be used to produce charcoal, but this is not a requirement. The conventional pyrolysis of freshly felled trees in single-use earth-mound kilns is no longer necessary thanks to a recent innovation, which makes it simpler to use domestic and agricultural waste for its manufacturing. This discovery may eventually lead to the elimination of the practice of igniting logs in open forests, which increases the risk of wild bushfires, as well as the decoupling of charcoal production from forest loss and degradation.

A proportion of Nigerian young still lack a comprehensive grasp of topics relating to climate science and global warming, according to research, despite the severe effects of climate change on the ecosystem (Okojie, 2019). As of 2020, more than six Nigerians out of 10 never heard about climate change. Only 30 per cent of respondents declared to have heard about this topic (Statista Research Department, 2023). Awareness of the topic resulted to be higher in urban Nigeria than in rural areas. Ojoma et. al (2015) in their study of the knowledge and attitude of people about climate change in Southern Nigeria found that participants were less knowledgeable about the effects of climate change on Nigeria as a whole but more aware of impacts relevant to Southern Nigeria, where study sites were located.

A study on awareness creation of the cultural practice of tree felling in Nigeria (Fori community, Maiduguri) shows that there is a limited understanding of people about the impact of climate change on their environment and as a result, deforestation is seen as a cultural means of livelihood (3) SDG Graduate School, University of Maiduguri, 2021). YouGov (2019) conducted a global survey of people living in 28 different countries to understand different attitudes regarding climate change in the East and the West. It was discerned that 90 per cent of the world believed in climate change, and cultural differences accounted for differences in the importance given to it. Despite interventions and support by mostly NGOs, the study found that there is a very poor understanding of what climate change entails. The negative impacts of climate change are tied to religious beliefs in other instances. This makes adopting climate-resilient strategies very difficult.

## **CONCLUSION AND RECOMMENDATION**

From the foregoing, it can be deduced that alternative cooking sources that emit less carbon into the atmosphere are readily available in the markets. The problem however stems from the lack of inclusion and consideration of communities in framing adaptation policies as they relate to household cooking sources. The Nigerian climate adaptation policy in trying to meet up with set targets of Net Zero emission internationally focused more on the big multinational companies and how they can contribute to meeting the set targets. The studies that have been identified in this study point to the fact that climate change adaptation as understood and applied in its scientific sense may be hampered by certain factors, especially in rural communities in Nigeria. It is therefore imperative to give

attention to the ontological realities of local communities in respect to climate change while coming up with policy strategies.

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