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The Challenge of Tackling Climate Change in Africa

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Abstract

The climate change phenomenon has occupied the attention of the world in the last decade as the world has struggled to understand its full impact. Several international legal instruments and initiatives such as the Intergovernmental Panel on Climate Change (IPCC), United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocols, the Paris Agreement, etc.,have been put in place to deal with the problem. This paper examined the attitude of African countries towards climate change in line with contemporary global efforts to contain the menace. It highlighted the efforts of African countries and strategies in coping with the challenges posed by climate change. In carrying out the study, doctrinal method of research was adopted. It was found, inter alia, that while most developed nations are proactive in developing state-based legislations to contain the vagaries of climate change. as they appreciate the consequence of inaction on climate change on the wellbeing of the planet earth, African countries (who ironically are even more impacted by the phenomenon) appear to be indifferent to the challenge of climate change, as they consider it a myth created to divert attention and stall their economic development.The paper found that the underlying consideration for the near absence of climate change laws and policies on the legal landscape of the African countries is the prioritisation of the economic welfare of its people above climate change concerns.

Keywords: Africa, climate-change, global warming, challenges, legal framework

1. Introduction

The environment is the supporting system for the survival and existence of all forms of life on the planet. It provides the physical milieu for interaction and the raw materials required for socio-economic development. Due to increased industrialisation, the earth is becoming warmer. The build-up of greenhouse gases has become a problem to our climate. It has resulted in a change in the earth's temperature to an abnormal level. Climatic change caused by global warming has had dangerous effects on people's health and the entire ecosystems. The earth's average temperature has risen by 1.4°F in the past century and is projected to rise even higher to between 2 to 11.5°F in the next hundred years. Little changes in the temperature of the planet can lead to large and potentially dangerous shifts in climate and average weather conditions. Rising global temperatures have been accompanied by changes in weather conditions and climate. Severe weather conditions have become common place with many places seeing changes in average rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves. The planet's oceans and glaciers have also experienced some big changes - oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising. These changes have become more pronounced in the 21st century and portend dangers to the environment.[1]

Climate change has become indubitably a very critical issue currently facing mankind. It impinges at the very heart of the sustainability of human lives and is seriously obstructing and compounding human efforts to attain sustainable development. It poses an existential threat to life on the planet if no action is taken to stem it. As this threat is largely anthropocentric in

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[1] EPA 'Climate Change: Basic Information' <*http://www.epa.gov/climatechange/basics/:*>accessed 1 October, 2021;C A Omaka, *Municipal and International Environmental Law* (Lagos: LUC Publishers, 2012) 23.

nature, it is up to humans to either totally reverse it or at best reduce the effect of its worst impact. The tragedy of it all is that while developed countries have initiated many these statutory and policy efforts to check the threat, African nations who will bear the brunt of climate worst impact because of their low adaptive capacity as a result pre-existing stresses issues such as poverty, political conflicts, and ecosystem degradation, have adopted a cavalier attitude towards combating the effect of climate change due perhaps with their pre-occupation with the economic development challenges of their people. This is of great concern as climate action should be a united effort for the whole world. The earth is a system where everything is interconnected. Climate change is not about warmer temperatures alone. Its effect is universal. Changes in one part of the system can influence changes in all others. It is therefore of immense concern that climate action in Africa, is not keeping pace with that of the developed world. Africa cannot afford to lag behind no matter the challenge. This aim of this paper is, therefore, to show Africa's efforts towards setting up state-based legal framework for tackling climate change.

2. Conceptual Clarifications

2. 1 Climate Change

Climate change is a term used to describe the long-term shifts in weather patterns which may occur either naturally through variations in the solar cycle or through human activities like fossil fuel production and consumption which has increased since the 1800s. Such fossil fuels include coal, petroleum and natural gas. [2]

2. 2 Fossil Fuels

The exploitation and "Burning of fossil fuels like coal for energy emits GHGs such as carbon dioxide and methane that covers the earth, trapping the suns and raising temperature."[3]The rise in temperature in the atmosphere can have a range of severe weather that affects the ecosystems, decline in biodiversity, melting of polar ice, rising sea levels, flooding, water scarcity, catastrophic storms, and droughts that render landscapes more susceptible to wildfires.[4]Deforestation, industrial processes, and some agricultural practices are other major sources that emit gases into the atmosphere including land filling with garbage. Cumulatively, the energy industry, transportation, buildings, construction, agriculture and land use are among the main emitters [5] resulting in GHG concentrations that have risen to their highest levels in 2 million years.[6]

Because of the continuous rise in emissions, the earth's temperature has risen to 1.1 C higher than it was in the 1800s, the 2011-2020 decade being the warmest. For people living in small island nations and other developing countries, rising ea-eve and saltwater intrusion have advanced to such an extent that those communities have had to relocate. Protracted droughts have caused famine in some regions thereby increasing the prospect of the rise in "climate

[2] United Nation, Climate Action. <https://www.un.org/en/climatechange/what-is-climate-change> accessed 8 May, 2022)

[3] Ibid.

[4]Effort to scientifically ascertain mechanisms responsible for recent global warming and related climate changes on Earth has focused on changes observed during the period of instrumental temperature record, particularly in the last 50 years. This is the period when human activity has grown fastest and observations of the atmosphere above the surface have become available. According to the Intergovernmental Panel on Climate Change (IPCC), it is "extremely likely that human influence was the dominant cause of global warming between 1951 and 2010

[5] Ibid.

[6]Ibid.

refugees." According to UN reports global warming could about 3.2C by the end of the century.[7] Little wonder NASA defines climate change as "a broad range of global phenomena created predominantly by burning fossil fuels, which add heat trapping gases to Earth's atmosphere. These phenomena include temperature trend described by global warming, but also encompass changes such as sea-level-rise; ice mass loss in Greenland, Antarctica, the Arctic and mountain glacier worldwide, shifts in flower/plants blooming and extreme weather events." [8]

2. 3 Global Warming

Global warming happens when Co2 and other GHGs and pollutants collect in the atmosphere and absorb sunlight and solar radiation that have bounced off the earth's surface and would ordinarily have escaped into space. These pollutants that can last for centuries in the atmosphere, trap the heat causing the earth to get hotter. The heat trapping gases mainly Co2, methane, nitrous oxides water vapour are called greenhouse gases. They produce the greenhouse effect which cause climate change even though natural cycles and fluctuations can also cause climate change. Recent climate in our era is attributed to human activities such as burning fossil fuel such as coal, oil and gasoline and natural gas which produce GHGs. The largest sources of GHGs are the transportation, electric power generation and industrial activity in that order.

Global warming is just one aspect of climate change which refers to increased changes in the measure of climate over a long period and includes precipitation, temperature and wind patterns includes rise in global temperatures due mainly to increased concentration of GHGs in the atmosphere just an aspect of climate. [9] Following the same line of thought, global warming has been described as referring only to the rising surface temperature of the earth while climate change includes such warming and its resultant effects like melting glaciers, increased and heavier rainstorm and drought meaning that global warming is just one aspect of the much bigger problem of human induced climate change. [10]

2. 4. Sustainable Development

The Brundtland Report, defined sustainable development as:

> *Development that meets the needs of the present without compromising the ability of the future generation to meet its own needs. A process of change in which exploitation of resources, the direction of investments, the orientation of technology development, and institutional change are all in harmony and enhance both current and future potential to meet human needs.*

With time, the definition of sustainable development has evolved holistically to link the three dimensions of sustainable development: - economic development, social inclusion and environmental sustainability.

The World Commission document states that sustainable development deals with "equity for human generations yet to come, whose interest are not represented by standard economic analysis or by market forces that discount the future and equity for people living now, who do not have equal access to natural resources or to social and economic goods. As the World

[7] UN Report, <https:www.ipcc.ch/report/sixth-assessment-report-cycle/> accessed 8 May, 2022).

[8] NASA, <https//climate.nasa.gov/resources/global-warming accessed, 15 May, 2022)

[9]This is according to US Geological Survey< https://www.usgs.gov/faqs/what-difference-between-global warming-and climate-change-1? Accessed, 15 May, 2022).

[10] See, Climate.Gov, <https://www.climate.gov/news-feature/climate-qa/whats-difference-between-global-warming-and-climate-change> accessed, 15 May6y, 2022).

Conservation Union puts it, sustainable development is about improving the human life while living within the carrying capacity of the supporting ecosystem. Sustainable development is therefore a process of social and economic betterment that satisfies the needs and values of all interest groups, while maintaining future options and conserving natural resources and diversity ". [11] It is a dynamic process [12] which means that to continually meet the needs of the present generation there has to be continued economic growth. Economic growth in turn means that minimum damage must be done to the environment.

The major resources that determine the wellbeing and quality of human life are shelter, air, water, energy, food, raw material and the environment. These natural resources ought to be exploited in a manner that ensures that the needs of the future generation will not be compromised while satisfying the needs of the present generation. Deforestation is one key factor against sustainable development. In the same vein deforestation orchestrating climate change. These natural resources ought to be exploited in a manner that ensures that the needs of future generation will not be compromised while satisfying the needs of the present generation. If this is effectively done, the menace of climate change would be minimized. The increasing global population will surely exert greater pressure on the rapidly depleting global natural resource base leading to adverse impacts on the environment as a result of the expected increase in industrial production. [13] The United Nations has set 17 Sustainable Development Goals (SDGs) to foster global sustainable development but the achievement of these sustainable development goals will largely depend on the adoption of eco-friendly and efficient methods of production by mining companies and enforcement of adequate laws and policies to guide their operations. By and large, the objective of sustainable development is to limiting the adverse environmental impacts resulting from the quest for social and economic development, which include climate change,[14] and most of the principles of sustainable development are beginning to assume persuasive force of law.

3. The Climate Change Debate and Impacts

Greenhouse gases occur naturally in the atmosphere as a critical component of the earth's temperature control system and essential to the survival of humans and millions of other living things. They function to keep some of the sun's warmth from reflecting back into space thereby making earth liveable. But after more than a century and a half of industrialisation, deforestation and large-scale agriculture by humans, quantities of greenhouse gases in the atmosphere have risen to record levels that have not been seen in millions of years. With population, economic, and standards of living growing, so does the cumulative level of greenhouse gas (GHGs) emissions associated with them.

In spite of the broad-based agreement and consensus backed by science that climate change caused mainly by human activity is occurring, some deniers known as "climate sceptics" continue cast doubt on the validity of the science and calling climate change an alarmism [15] The

[11](IUCN,1980).

[12] O A Olaniyi and O **A** Funmilayo and I O Olutimehin, 'Review of Climate Change and its Effect on Nigeria Ecosystem' (2014)*InternationalJournal of Environment and Pollution Research*, (2014) (2) (.3).70-81,

[13] J C Nnaji and A Igbuku, 'Improving the Eco-Innovation Status of Africa Using Sustainable Chemistry Principles', (2018) 3 (1) European *Journal of Sustainable Development Research*, 1-9.

[14] See, Brundtland Report, chap. 2, para 14.

[15] The U.S. Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration concur that climate change is indeed occurring and is almost certainly due to human activity.

"climate change deniers" as they are also known, claim that recent changes attributed to human activity are part of the natural variations in earth's climate and temperature and asserting that it is near impossible to make a direct link between climate change and any major weather event. While there may be some elements of truth in the latter, decades of data and analysis support the reality of climate change—and the human input in the process. Some member countries in the extractive industries hold non-committal positions and some have even attempted to convince the public that climate change is not happening.[16]But the U.S. Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration agree that climate change is indeed happening and is almost certainly due to human activity. Studies by 2,500 scientists from 130 countries, part of the United Nations-sponsored Intergovernmental Panel on Climate Change (IPCC), appears to have settled the issue. [17] In February 2007, the IPCC provided convincing scientific evidence that the use of fossil fuels like coal, oil, and natural gas is releasing billions of tons of heat-trapping GHGs into the atmosphere, causing air, ground, and ocean temperatures around the world to rise at an alarming rate. [18] Historical estimates of past climate changes also suggest that the recent changes in global surface temperature are unusual. Computer-based climate models cannot replicate the observed warming without the human fingerprint of greenhouse gas emissions thereby reinforcing its anthropocentric origin. This means that natural forces alone (such as a solar and volcanic activity) cannot explain the observed warming.[19]

As humans continue to gobble up natural resources at an alarming and unsustainable rate to expand their domination of nature, climate change continues unabated. One of the key findings of the United Nation Environment's *Global Resources Outlook 2019,* was that the extraction and processing of material, fuels, and food are principal culprits in climate change and biodiversity loss contributing half of the total global greenhouse gas emissions and over 90 percent of biodiversity loss and water stress.[20]

The transportation and the concrete-based building sector (the most widely used construction material worldwide) are an additional major source of greenhouse gases also and account for about eight percent of carbon dioxide emissions, according to a recent Chatham House report. [21] Added to this is the fact that, species are disappearing, habitats are being lost, and ecosystems functions breaking down as humans bulldoze and burn down forests and other natural areas. These activities have far-reaching adverse effects on lives on earth as they lead to decreasing

[16]US NRC 'Understanding and Responding to Climate Change'. A brochure prepared by the US National Research Council (US NRC) (PDF). Washington DC: Board on Atmospheric Sciences and Climate, National Academy of Sciences.(2008).

[17]The Intergovernmental Panel on Climate Change (IPCC) was set up by the World Meteorological Organization (WMO) and United Nations Environment to provide an objective source of scientific information. In 2013 the IPCC provided more clarity about the role of human activities in climate change when it released its Fifth Assessment Report. It is categorical in its conclusion: climate change is real and human activities are the main cause. The Fifth Assessment report provides a comprehensive assessment of sea level rise, and its causes, over the past few decades. It also estimates cumulative CO_2 emissions since pre-industrial times and provides a CO_2 budget for future emissions to limit warming to less than 2°C. About half of this maximum amount was already emitted by 2011. The report found that:From 1880 to 2012, the average global temperature increased by 0.85°C

[18] Michael Fleshman, 'Climate Change: Africa Gets Ready: Planning how to Deal with HigherTemperatures, Shifting Weather' (2007) *Africa Renewal*.

[19]Ibid.

[20]*Global Resources Outlook* prepared by the International Resource Panel on Environment of the UN, 2019.

[21] J Lehne and F Preston, 'Concrete is Responsible for 8 per cent of all CO2 Emissions' Chatham House Report, 2 January. 2019< https:/www.architectsjournal.co. uk> accessed: 10 May 2021 10 am.

plant productivity and food production, the extinction of plants and animal species, increased environmental-related diseases. Nobody is insulated from the effects of climate change. However, paradoxically, it the humans who play a major role in these catastrophic changes that are the principal victims of climate change as the consequences of their actions or inactions and the ill effects of climate change takes their toll. Climate change has been linked to greater risk from zoonotic diseases. Increase in temperature or rainfall can affect the life cycles of either the pathogen or its vector-the intermediate species which spread the disease from its original host to human beings. Coral reefs which are especially susceptible to effects of climate change are projected to decline exponentially due to global warming effect. The ocean has absorbed more than 90% of the excess heat in the climate system which in turn makes it more acidic and less productive and threatening marine life.

3.1 Regional Impacts of Global Warming

Regional effects of global warming are significant long-term changes in the expected patterns of the average weather of a specific region due to global warming. When the global temperature changes, the climate changes are not expected to be uniform across the earth. Land areas change more quickly than oceans, and northern high latitudes change more quickly than the tropics. Some are the result of a general global change, such as rising temperature, resulting in local effects like melting ice. In other cases, it may be related to a change in a particular ocean current or weather system. In such cases, the regional effect may be disproportionate and will not necessarily follow the global pattern. Global warming can bring changes to the regional climate either by melting or forming ice, changing the hydrological cycle (of evaporation and precipitation), and changing ocean currents and atmospheric air flows. The coast can also suffer severe impacts from sea-level rise. Scientists have concluded that physical and biological systems on all continents and in most oceans had been affected by recent climate changes, particularly regional temperature increases.[22] Regional impacts include changes in regional rainfall patterns,[23] earlier leafing of trees and plants; movements of species to higher latitudes and altitudes in the Northern hemisphere; changes in bird migrations in Europe, North America, and Australia; and shifting of the oceans' plankton and fish from cold- to warm-adapted communities.[24]

3.1.1 Impacts on Africa

Africa is likely to be the continent most vulnerable to climate change.[25] It is projected that " in many African countries and regions, agricultural production and food security would probably be severely compromised by climate change and climate variability" [26]due to pre -existing multiple

[22] Rosenzweig; and others., 'Chapter 1: Assessment of Observed Changes and Responses in Natural and Managed Systems',Executive Summaryin IPCC AR4 WG2 2007

[23] M. K., Roxy and others, 'Twofold Expansion of the Indo-Pacific Warm pool Warps the MJO Life cycle'. *Nature*. (2019) **575** (7784): 647–651.

[24] C Rosenzweig, 'Science Briefs: Warming Climate is Changing Life on Global Scale' (December 2008)."Website of the US National Aeronautics and Space Administration, Goddard Institute for Space Studies. Accessed 7 May, 2020. 12 pm.

[25] SH Schneider *et al*, 'Regional Vulnerabilities'. in M L Parry,*et al* (eds.) *Chapter 19: Assessing Key Vulnerabilities and the Risk from Climate Change*: *Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). (Cambridge UK: Cambridge University Press, 2007)

[26] M Boko *et al*, 'Executive Summary' in M.L. Parry and others. (eds.) *Chapter 9: Africa*. Climate Change 2007: Impacts, Adaptation, and Vulnerability: contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). (Cambridge UK: Cambridge University Press, 2007)

stresses issues and low adaptive capacity such as poverty, political conflicts, and ecosystem degradation. According to Boko *et al.*:[27]

a) By 2050, between 350 million and 601 million people may experience increased water stress due to climate change

b) Climate variability and change are will severely compromise agricultural production, including access to food, resulting in food insecurity.

c) Toward the end of the 21st century, projected sea-level rise will likely affect low-lying coastal areas with large populations

d) Climate variability and change in Africa will negatively impact human health where malaria is already endemic.

There has been a decrease in rainfall over large parts of the Sahel and Southern Africa, and an increase in parts of Central Africa. Over the past 25 years, the number of weather-related disasters, such as floods and droughts, has doubled, resulting in Africa having a higher mortality rate from droughts than any other region. Flooding is the most prevalent disaster in North Africa, the second most common in East, South, and Central Africa, and the third most common in West Africa.[28]

In North Africa, the 2001 disastrous flood in northern Algeria resulted in about 800 deaths and economic loss of about $400 million. In Mozambique, the 2000 flood (worsened by two cyclones) caused 800 deaths, affected about 2 million people of which about 1 million needed food, 329,000 people were displaced and agricultural production land was destroyed. Between July 2011 and mid-2012, a severe drought affected the entire East Africa region and was said to be "the worst drought in 60 years." [29]

Across Africa, "flooding, drought, change in rainfall distribution, drying-up of rivers, melting of glaciers on the Kilimanjaro Mountain and the receding of water bodies" are observable effects of climate change [30] It is estimated that 82% of the ice that capped the mountain, when it was first recorded in 1912, is now gone.[31] The landscape is changing. Heat stress, and flooding have led to a reduction in crop yields and livestock productivity. East Africa is facing the worst food crisis in the 21st century. According to Oxfam, 12 million people in Ethiopia, Kenya, and Somalia needed food as rainfall has been below average with 2010 and 2011 being the driest, after the great drought of 1950/1951 in the regions of Ethiopia, Kenya, and Somalia- a serious problem for a continent almost entirely dependent on rain for its agriculture. [32]

Climate-sensitive diseases and health impacts can be high in poor countries that have minimal resources to treat and prevent illness. Examples of climate-related health impacts include:

a) Frequent and severe heat stress linked to sustained increases in temperature

[27]Ibid.
[28] (AWDR, 2006).
[29]Ibid.
[30] Entire economies suffer when the water levels of Africa's huge rivers drop. Ghana, for example, has become totally reliant on the hydro-electric output of the Akosombo dam on the river Volta. Mali is dependent on the river Niger for food, water and transport. However, great stretches of the river is now facing environmental devastation as a result of pollution. In Nigeria, most people have no access to clean water.
[31] IPCC, (2001).
[32]<http://www.oxfam.org/sites> accessed 29/5/2020. 6pm.

b) The reduction in air quality that often accompanies a heat wave can lead to breathing problems and worsening respiratory diseases.

c) Impacts of climate change on agriculture and other food systems increases rates of malnutrition contributing to poverty. "With one in four people still undernourished in sub-Saharan Africa, climate change impacts make it even more difficult for governments across the region to improve food security and help reduce tensions." [33]

d) The spread of malaria may increase in areas projected to receive more precipitation and flooding. Increases in rainfall and temperature can cause the spreading of dengue fever

According to the IPCC report,[34] severe flooding and intense droughts have led to the destruction of many homes, shelters, and villages across Africa. Conflicts over resources also exacerbate these impacts and, in turn, contribute to the ongoing migration within and between countries in Africa. Extreme events displace large amounts of people, especially those who are unable to respond and rebuild after disasters, due to lack of resources.[35] Women, children, and the elderly are more vulnerable to climate change impacts across Africa as women labourers often have additional duties as caregivers because of male migration as a result of societal responses to climate change after extreme weather events [36] The water scarcity places an additional burden on African women, who walk hours and sometimes even days, to fetch it. Children and the elderly face graver risks due to susceptibility to infectious diseases, such as malaria, limited mobility, and reduced intake of food. The elderly face physical danger and even death due to droughts, heat stress, and wildfires. Children often die from starvation, malnutrition, diarrheal diseases, and flooding.[37] According to the Climate ChangeVulnerability Index for 2015, seven of the ten countries most at risk from climate change are in Africa.[38]

The security implication and consequences of climate change is not lost. It has been emphasised by the UN Security Council which noted that the economic, political, and social consequences of climate change could threaten world peace unless the world acts to prevent it.[39]According to the UK Foreign Secretary who chaired the Security Council meeting "…the world should recognise the security as well as economic, developmental and environmental imperatives to tackle climate change". Ugandan President Yoweri Museveni, described climate change as 'an act of aggression' by the polluting industrial North against the developing South. This comment underscored the linkage between the environment and world peace. The UN Secretary-General, Ban Kim Moon, added that "Throughout human history, people have fought over natural resources. Changing weather patterns, floods and droughts and related economic costs'... have the potential risk of polarising society and marginalising communities, thereby increasing the risk of conflict and violence" [40]This goes to show that climate change impacts have the potential

[33]<http:/ecowatch.com/2014/10/30;extreme-weather-climate-change>.
[34] IPCC Report, 2014.
[35] Ibid.
[36] Ibid.
[37]Ibid.
[38]Dec 12, 2014
[39] At a special Security Council meeting, an initiative of the UK, chaired by the UK Foreign Secretary, Margret Beckett marking the first time the Council addressed climate change, 17 April, 2007.
[40]Ibid.

to exacerbate national security issues and increase the number of international conflicts as often occurs over the use of limited natural resources, fertile ground, and water.

Access to consistent and dependable sources of water is greatly valued in many African regions. However, changes in the timing and intensity of rainfall have threatened water availability and are causing conflicts.[41]A United Nations report predicts that access to water may be the single biggest cause of conflict and war in Africa in the next 25 yearsmore especially in countries where rivers or lakes are shared by more than one country.[42]Changes in precipitation and temperature are already affecting crop yields in Sub-Saharan Africa, resulting in food shortages that have triggered cross-border migration and intra-regional conflicts, and sparked political instability in Nigeria for example.[43] Climate change has led to changes in freshwater and marine ecosystems in eastern and southern Africa, and terrestrial ecosystems in southern and western Africa. The extreme weather events have demonstrated the vulnerability of some of South Africa's ecosystems. In response to climate change, the migration patterns, geographic range, and seasonal activity of many terrestrial and marine species have shifted. The abundance and interaction among species have also changed.[44]

On a happy note however, Africa is fortunate to have large reserves of untapped water which are likely to benefit the dry areas with increased rain. The Sahel and other arid and semi-arid regions are however expected to become even drier putting the African people living along area susceptible to drought and climate changes could have their lives and livelihoods at risk by the end of the coming decade. Flood-prone areas in Southern Africa are likely to become wetter resulting in frequent and more severe floods because of shifting rainfall patterns and this can cause resources to be diverted from development to emergency relief.[45]

In Africa, farming accounts for a lot of employment and is the basis for national economies generating export earnings, industrial raw materials, and inexpensive food. The farming however, which relies on rain fed irrigation, constrained by poor quality soil, outdated technology and farming methods, is likely to be hit hard as droughts and flooding worsen; temperatures and growing seasons change, and farmers and herders are forced off their land spelling humanitarian and economic crisis. As lakes and rivers dry up, rising water temperatures destroy commercial species of fish, the important fishing industry is also likely to suffer. East Africa's low-lying islands and coastal regions are at risk of being permanently submerged because of frequent flooding.

Higher water temperatures are expected to increase the power and frequency of hurricanes and other violent ocean storms. Africa's coastal fisheries and the fragile ecosystems that support them could also be damaged if higher sea levels push saltwater inland and destroy freshwater estuaries and coastal farmland. Cities will be under strain to provide jobs, housing, and basic services, and will themselves be under threat from the effects of climate change as millions of "environmentally displaced" person cross borders in search of new life.

[41]Ibid.
[42]< http://www.epa.gov/climatechange/impacts-adaptation/international.html>. See also UN special Security Council meeting, on climate change, accessed 17 April, 2007. 1 pm.
[43]Ibid.
[44]Ibid.
[45]Ibid.

Climate change will also spread parasites like the tsetse fly and malaria spread by mosquitoes - the single greatest killer of African children-as regions currently outside the malaria zone may become infested as they get hotter and wetter and imposes a drain on African economies through death, medical costs, and lost productivity. Africa's diverse plant and wild life population (e.g., South Africa Kruger Game Reserve) may not be spared as some of them would lose much of their natural habitat to climate change.

4. Tackling Climate Change

Regardless of the divisive and protracted debate over the causes and potential impact of global warming, a plethora of scientists agree that every increase in global temperature has a consequence and that. limiting global warming to not exceed 1.5 degrees Celsius would be ideal to avoid the adverse impacts of climate change and making the earth liveable.

After decades of scientific findings, there is a near consensus that climate change is happening and the only thing that drives global warming is the total amount of heat-trapping gases in the atmosphere. [46] It has also been agreed that the answer to our climate crisis is to achieve net-zero greenhouse gas emissions as soon as economically possible.In addition,fairly established is the fact that climate change has both natural and human or anthropogenic causes; and the interaction of both sources are inevitable; that 80% of human causes of adverse climate change are attributed to the developmental activities undertaken by advanced nations; and that almost 85% of the negative consequences are borne by developing countries.[47] Global warming/climate change is therefore expected "to impact developing countries more than wealthier countries, as most of them have a high 'climate vulnerability'.[48]

5. Role of the United Nations Organisation on Climate Change

Predictably, the United Nations General Assembly is the arrowhead of global efforts to address the causes of global warming and save our planet. In 1992, its "Earth Summit" produced the United Nations Framework Convention on Climate Change (UNFCCC) as a first step in

[46]This was the message delivered in Paris in 2015, after every country in the world had signed the Paris Agreement, *i.e.* to limit global temperature rise to well below 2 degrees Celsius and as close as possible to 1.5 degrees Celsius above pre-industrial levels. To do this, it is imperative for businesses; policy makers and civil society promote a holistic near and long-term climate action in line with the goals of the Paris agreement on climate change.

[47] S A Maikasuwa, 'Climate Change and Developing Countries: Issues and Policy Implications', (2013) 1 (2) *Journal of Research and Development*.

[48] According to the World Health Organization, by the year 2030, climate change is expected to contribute to approximately 250,000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress, especially in developing countries (June 23, 2020). Wikipedia, the free encyclopaedia, defines Developing countries as countries with economies that have a low gross domestic product (GDP) per capita and rely heavily on agriculture as the primary industry. When it comes to regions of the world, developing countries have not quite reached economic maturity, although there's a wide array of different definitions. It is a country with a less developed industrial base and a low Human Development Index (HDI) relative to other countries. However, this definition is not universally agreed upon. Least developed countries, landlocked developing countries and small island developing states are all sub-groupings of developing countries. Countries on the other end of the spectrum are usually referred to as high-income countries or developed countries. Developing countries tend to have some characteristics in common often due to their histories or geographies. For example, with regards to health risks, they commonly have: low levels of access to safe drinking water, sanitation and hygiene; energy poverty; high levels of pollution (e.g. air pollution, indoor air pollution, water pollution); high proportion of people with tropical and infectious diseases (neglected tropical diseases); a high number of road traffic accidents; and generally poor infrastructure. Often, there is also widespread poverty, high crime rates, low education levels, inadequate access to family planning services, many informal settlements, corruption at all government levels, and political instability. The term "Global South" is used by some as an alternative term to developing countries.

addressing the climate change problem. Today, as the world's only truly universal global organisation, it has a near-universal membership addressing issues that transcend national boundaries that cannot be resolved by any one country acting alone. It has predictably, added the climate change challenges to its repertoire and the initial goal of safeguarding peace and protecting human rights amongst others.

6. International Legal Instruments on Climate Change

The global political landscape is replete with initiatives at the global, regional, and sub-regional levels to develop strategies to address the challenges of climate change. At the global level, such initiatives include the Intergovernmental Panel on Climate Change (IPCC), United Nations Framework Convention on Climate Change (UNFCCC) the Kyoto Protocol (and its amendment) and the Paris Agreement 2015 adopted by consensus and entered into force on 4 November 2016.

The UNFCCC provides the key legal framework that articulates the general principles and objectives governing adaptation. [49] The pivotal nature of adaptation responses in tackling the adverse effects of climate change are underscored in a number of key articles in the UNFCCC text. [50] Article 4.1(f) provides that 'where feasible, parties are to take climate change considerations into account in their relevant social, economic and environmental policies and actions'. Parties are further to employ suitable techniques, including impact assessments, to curtail the adverse effects of adaptation projects or measures on the economy, public health and the quality of the environment (UNFCCC article 4.1[f]). The rationale of this provision is to caution societies concerning the prospect of the social, economic and environmental policies and actions that fail to consider how climate change considerations degenerate into maladaptation [51] In addition, using terms such as "to the extent feasible" and "as formulated and determined nationally" imply that the issue of mainstreaming and the scale and application of impact assessment as issues best to be determined by respective state parties.

Parties to the Convention have agreed to further commitments during UNFCCC Conferences of the Parties. To tackle climate change and its adverse impacts, the Paris Agreement which is a legally binding international treaty, sets long term goals to guide member nations to:

a) Substantially reduce GHG emissions to limit global temperature rise in this century to 2degrees Celsius while pursuing effort to further limit the increase to 1.5degrees Celsius.

b) To review nation' commitment every five years

c) To provide financing to developing countries to mitigate, change and strengthen resilience and their adaptation abilities to climate change impacts.

Significantly, the agreement provides an avenue for developed nations to provide the finance needed by the developing countries in their climate adaptation and mitigation efforts while also providing the mechanism for reporting and monitoring. The agreement commits every country to reduce emissions while working together to adapt to the impact change. It provides a framework to guide global effort to shift towards net-zero emission. Its implementation is essential for the

[49] J B Ruhl, 'Climate Change Adaptation and the Structural Transformation of Environmental Law'. *Environmental Law* (2010). (40)(2), 363-431.

[50] D. Freestone, 'The International Legal Framework for Adaptation', in Michael B.G. & Fischer, K.K. (Eds), The Law of Adaptation to Climate Change: U.S. and International Aspects, Chicago, American Bar Association. (2012).

[51] Y Farhana and J Depledge, *The International Climate Change Regime: A Guide to Rules: Institutions and Procedures* (Cambridge, Cambridge University Press, 2004).

achievement of the Sustainable Development Goals.[52] Every country is required to submit its national action plan known as the Nationally Determined Contribution (NDC) It is through their NDCs that countries communicate the actions they will take to reduce their GHG emissions and build resilience in order to reach the Paris Agreement goals. Countries are also required to formulate and submit long term strategies which are however non-mandatory. [53]

7. Africa's Efforts in Climate Change Legislation

In African policy circles, climate change is often regarded as a technical problem which requires technical solutions. Africans have been adjusting to occurrences such as heat waves, drought, flood, and fire for years. [54] Therefore, it can be argued that, to some extent, adapting to climatic changes in their extremes, frequency, and distribution may require simply transforming and strengthening existing adaptation policies and strategies in Africa. In this regard, the AU Assembly has made significant decisions that ignited the advancement of Africa's common position on climate change. The 8th ordinary session encouraged member states and the Regional Economic Communities (RECs) to incorporate climate change concerns in their respective development policies and programmes (AU Assembly, 2004). [55]

This includes Africa's preparations for the development of a common position on climate change and an inclusive agenda on African climate change programmes. However, some of the adverse effects of climate change introduce completely new forms of challenges that most African countries lack the needed technological and knowledge systems for in order to adapt. For instance, most of the populations in Africa have not dealt with sea level rise on any significant scale [56] Another example is the mass migration of species in response to changing temperature, hydrology, and other environmental patterns. [57] Although these are not inconceivable climatic events, most African countries lack the requisite models on how to manage them. As a result, designing adaptation strategies for this form of change will involve some level of borrowing from and hybridization of existing policy mechanism and technological methods. [58] For instance, coastal defence strategies already being used for storm surge protection could be employed as part of the response to sea-level rise and some level of developing new adaptation approach. [59]

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[52] The Sustainable Development Goals are a call for action by all countries to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection and job opportunities, while tackling climate change and environmental protection. Goal 13 calls for urgent action to combat climate change and its impacts. But all of the goals influence climate change one way or the other. Little progress on climate action can be made without accelerating achievement of Goal 7 on affordable and clean energy, or on Goal 12 on responsible consumption and production. Climate solutions can support the goals such as through a just transition to renewable energy centred on providing decent work, the focus of Goal 8, or through developing resilient infrastructure under Goal 9.

[53]The operational details for the practical implementation of the Paris Agreement were agreed on at the UN Climate Change Conference (COP24) in Katowice, Poland, in December 2018, called the Paris Rulebook, and finalised at COP26 in Glasgow, Scotland, in November 2021.

[54] M Addaney and E Boshoff and B Oyetola, 'The Climate Change and Human Rights Nexus in African', *Special Edition on the Environment and International Law. Amsterdam Law Forum* (2017) (9) (3), 5–28.

[55]Ibid.

[56]Ibid.

[57] M A Abebe, 'Climate Change, Gender Inequality and Migration in East Africa', *Washington Journal of Environmental Law & Policy* (2014) (4) (2).

[58] J B Ruhl, 'General Design Principles for Resilience and Adaptive Capacity in Legal Systems - With Applications to Climate Change Adaptation', (2011) 89 *North Carolina Law Review*, 1373.

[59]*Ibid.*

The third special session of the African Ministerial Conference on the Environment (AMCEN) in Nairobi in May 2009 presented a decisive occasion in the response of Africa to the threats of climate change. The Nairobi Declaration on the African Process for Combating Climate Change was adopted by the Ministers to serve as a unified manifestation of the continent's determination to play a pivotal role in addressing the challenge of climate change. The Declaration emphasises the determination of the AMCEN to assimilate adaptation measures into national and regional development plans, policies and strategies, where appropriate, in order to guarantee adaptation to climate change in key areas, such as the environment and energy security (AMCEN, 2009). Nevertheless, many African countries are yet to adopt substantive climate change law except Kenya and Nigeria.

The Kenyan Climate Change Act of 2016 contains some relevant provisions on adaptation mainstreaming. For instance, under article 3(2) of the Climate Change Act (2016), on the objects and purposes, it provides that:

'without prejudice to subsection (1), this Act shall be applied in all sectors of the economy by the national and county governments to (a) mainstream climate change responses into development planning, decision making and implementation; (b) build resilience and enhance adaptive capacity to the impacts of climate change; (c) formulate programmes and plans to enhance the resilience and adaptive capacity of human and ecological systems to the impacts of climate change; (d) mainstream and reinforce climate change disaster risk reduction into strategies and actions of public and private entities; (e) mainstream intergenerational and gender equity in all aspects of climate change responses'.

There are also narratives peculiar to countries like Nigeria whose climate change policy is dictated by its economic needs. Not only is its economy highly dependent on fossil fuel which is implicated in GHG emission, the country is also highly vulnerable to the adverse effects of global warming because of its geographical location

Nigeria first developed a climate change policy, the Nigeria Climate Change Policy Response and Strategy (NCCPRS) in 2012 to promote low-carbon emissions and to respond effectively to the impacts of climate change, such as extreme weather events, food insecurity etc. In 2021, the Federal Ministry of Environment, through the Department of Climate Change introduced the National Climate Change Policy (NCCP) for the 2021 to 2030 period. The NCCP sets out Nigeria's climate change policy direction, addresses conditions required to attain Nigeria's vision to be a climate resilient economy, and sectoral measures for mitigating the effects for climate change in Nigeria.

Muhammadu Buhari signed into law the Climate Change Act, 2021. The Act seeks to provide a framework for achieving low GHG emissions and to mainstream climate change actions into national plans and programs. In the words of Chukwumerije Okereke, [60] 'the new climate change law sends a strong positive message to the world that Nigeria understands the enormity and urgency of the climate change challenge and is serious to implement the net-zero carbon pledge made by Buhari at COP26 in Glasgow.'

[60].Chukwumerije Okereke, the director of the Center of Climate Change and Development, Alex Ekwueme Federal University Nigeria, and head of the Technical Committee that revised the Climate Change Bill .

At the state level however, Ebonyi State Nigeria is the first to formulate a climate change law that is ready for Governor's assent. According to the major drafter of the law, Amari Omaka,[61]the Climate Change (Control and Enforcement, Etc.) Law of Ebony State is a law that establishes a comprehensive response to climate change, to provide for the control, regulation, enforcement, and governance of the state response to climate change, to introduce a system for the measurement, reporting, and verification of greenhouse gas emissions in Ebonyi State Federal Republic of Nigeria and related matters. Ebony state is setting the pace by formulating a policy framework on agriculture in response to climate change. A study of some rural communities in the state shows an increased incidence of floods, erosions, prolonged dry spells, irregular rainy seasons, heat waves, and wind storms.[62] The impact of climate change is so severe that if not put in check it is capable of stagnating the economic growth and development of the State. It therefore no surprise that in June 2020, the state gathered both local and international stakeholders to brainstorm and formulate a policy document on climate change, and also to enact a climate change law.[63] Recognizing on the one hand that agriculture is the most important source of livelihood for a great majority of the people of the state, and on the other hand that the sector is one of the most vulnerable to climate change, it has been deemed a top priority to further elaborate a climate change Action Plan that can offer a guide to managing the threat of climate change in the agricultural sector in the state. The document sets out a climate change adaptation action plan for Ebonyi State Nigeria. The Ebonyi State Government developed a climate change policy that recognises the huge impact that climate change poses to agriculture in the state and outlines several policy measures intended to tackle the challenge and build resilience in the sector.

These provisions are very progressive and comply with the normative standards of relevant international and regional climate change adaptation policies, including the Cancun Adaptation Framework and the draft AU Climate Change Strategy. Regarding its implementation, it is too early to have a fair assessment on how it has translated into practice.

The Draft AU Strategy on Climate Change is still under development (AU Draft Strategy 2014). It, however, contains vital guidelines on adaptation. The overall objective of this strategy is to enable the continent achieve "*climate-smart*" socio-economic development. Regarding Africa's position on adaptation, it underscores that the importance of recognising the fact that adaptation is an overriding priority for the African continent. It places an urgent call for the implementation of adaptation measures and actions, including through the provision of substantial new and additional public financial resources, environmentally sound technologies and capacity building in a predictable and prompt manner (AU Draft Strategy 2014). The AU draft strategy (2015) outlines some major considerations on adaptation to guide member states including:

[61]The expert who drafted the bill for Ebonyi State Government Nigeria in 2020, and one of the authors of this paper.
[62]See Climate Change Adaptation Action Plan for The Agriculture Sector In Ebonyi State Nigeria, 2020.
[63]The lead author of this paper, Prof Amari Omaka (Senior Advocate of Nigeria) was among the team of experts that drafted the policy document, and the principal environmental law expert that formulated the draft bill of Climate Change Law in Ebony State for Ebony State Government in Nigeria.

> *The focus of adaptation must shift from vulnerability assessment to the implementation of adaptation programmes… Funding by developed countries for adaptation must reflect responsibility for economic and social damages resulting from climate change in the context of their historical contributions to greenhouse gases and current climate change…Funding for implementation of adaptation must be massively scaled up, in accordance with the need, and must go beyond the mainstreaming of adaptation into the development process, and include stand-alone adaptation projects.*

A review of climate change laws and policies in Africa shows that many countries do not have legislative and policy frameworks on climate change. Their performance is quite dismal. Attention is more on adaptation or setting adaptation action as a priority. Information generation and sharing, adaptation planning, establishing institutional arrangements, and processes for managing and monitoring adaptation action are common areas of focus. These are useful for directing attention to priority areas: for example, climate risk information is fundamental to effective adaptation planning and a priority for the majority of countries. But the more complex solutions, such as investing in the physical and social infrastructure that is required to adapt to climate change, are largely lacking. Other apparent gaps include enhanced investment in public goods that go beyond hazard early warning systems.[64]

8. Conclusion

Climate change is a global problem that transcends national boundaries and therefore needs international co-operation and co-ordinate actions at every level. It implicates virtually every aspect of a state's economic growth and development. It is not a conventional environmental matter per se. It is an economic and environmental matter all rolled into one. It has become one of the greatest environmental challenges that humanity faces. It is clear that the level of the challenge posed can only be tackled on an international basis because emission has no geographical boundary. It has been dubbed a humanitarian crisis that acts as a "threat multiplier, tipping difficult situations over the edge or narrowing options for solving problems."It will continue at a pace determined by past, present, and future emissions of heat-trapping gases.. An effective, lasting climate solution requires a careful balancing of interests, which typically can be achieved through strong climate legislative instruments, laws, and regulations. The consequence of unbalancing the earth's weather by climate change is that the planet's ecosystems sustainability is imperilled together with the future of humanity and the stability of world economy. The global warming trends can be halted by a change in every aspect of our interaction with nature. As Zeno said, "The goal of life is living in agreement with nature".[65]

A holistic approach in the derivation of viable and effective solutions remains the only hope in creating a sustainable balance between the needs of man and nature. Therefore, the commitment to end global warming should be holistic and comprehensive for the greater good. However, it should be borne in mind that adapting to the adverse impacts of climate change will continue to raise legal issues and intensify existing environmental protection regulatory challenges. Human migration and infrastructural development could trigger disputes over environmental, land-use, and legal responses.[66] Climate action requires a great deal of financial investment no doubt, but not taking action and dealing with the aftermath can be even more costly in the long run. If

[64]Policy Publication, 9 December, 2019.
[65] Zeno, 450 BC.
[66]Bodansky, 2010.

industrialised countries fulfil their commitment to provide $100 billion a year to developing countries, it will make it easier for them to put adaption structure in place barring any misuse or diversion of the fund to other areas. Private sector finance can also be an alternate source of climate action funds.

Unlike before, the world now has the knowledge, the know-how, science and the technology to put things right. Africa can borrow from the technology. All she needs is the political will and change of priorities. The world is now at cross-roads. With the available irrefutable scientific evidence, the planet may not survive the worst consequences of climate change if nothing is done. We have only one planet. The future of the planet depends on how humans share it with the plants and animals.

9. Recommendations

Although climate change presents humanity with unprecedented challenge, some solutions are already available in forms that can simultaneously deliver both economic and environmental benefits. There are global agreements such as the Sustainable Development Goals, the United Nation Framework Convention on Climate Change, the Kyoto Protocol and the Paris Agreement providing broad categories of action for cutting emissions and adapting to climate change impacts and limit temperature rise to 1.5 degrees Celsius. Due to Africa's peculiar climate change vulnerability, unsustainable land use in food production, deforestation, grazing, digestion by livestock, manure and fertilizer production, energy for running farm equipment, food packaging and distribution using fossil should be transformed. African countries should undertake a gradual and humane switch based on the principle of "just transition" from fossil fuels to renewable energy sources like solar or wind to reduce emissions that cause climate change because of the socio-economic fallouts. In doing so, it is recommended that other African countries follow the lead of Kenya and Nigeria in legislating on climate change as climate change legislation is a sine qua non in the fight against global warming and its consequences.

Practices that can advance climate adaptation such as erosion control, better grazing and sustainable land management, genetically modified food that can withstand heat and drought should be introduced. The consumption of healthy foods and sustainable diets can reduce emissions from food systems and consequently improve health outcomes. [67]

African countries should lobby hard and put pressure on the developed countries to make good on their pledge to provide climate financial assistance including $100 billion that have agreed to provide to developing countries each year to supports critical infrastructure for adaptation, resilience and the new renewable energy-based economy.

Adaptation can be achieved by protecting ecosystems and biodiversity while access to early warning systems such as weather alerts can deliver benefits. Better weather data and emergency management systems can reduce physical damage and economic losses. Solar-powered irrigation, new crop varieties and other adaptive measures can help avoid a drop-off in global agricultural yields. Improving health systems could help prevent climate- related deaths mainly from avoidable causes such as malnutrition, malaria, diarrhoea and heat stress.[68]

Giving African women a voice and role in decision-making can empower them on climate change-related issues which can advance sustainable development and greater gender equality

[67] FAO; UNEP; IPCC; World Bank; United Nations.
[68] UN 2020; UN Climate Action, World Bank.

because as first respondents in crisis, entrepreneurs of green energy and decision makers at home, they can have profound critical insights and solutions into managing climate change and its attendant risks.

Transiting to a green or circular economy based on the principles of reduce, reuse and recycle would create jobs in recycling and waste management industries is recommended[69] This could yield a direct economic gain compared to the linear type of economic system by producing millions of new low-carbon jobs.For the planet to have a liveable climate, net-zero commitments must be backed by credible action because science has established that the worst impacts of climate change can be averted by doing so or by cutting GHG emission to as close to zero percent degree as possible leaving the remaining emissions to be re-absorbed by the oceans and forests acting as sinks. This calls for nothing less than a complete transformation of how we produce, consume, and move about.

[69]ILO (1), World Bank (2), IRENA (3), IRENA (4, 8, 9), UN (5), ILO