

# A Legal Appraisal of the Response to the Challenges Related to Climate Change in Nigeria

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*In view of its notable impact today, it is almost no more debatable that climate change is one of the greatest challenges affecting the human environment in this century. Though largely caused by mankind, the adverse impact of climate change is felt across every facet that affects humanity. At the global arena, the issue of climate change remains a hotter debate among pundits including legal scholars over the decades. The raison d'être for this worldwide concern is not farfetched given the ripple effects of climate change on humanity. Nigeria popularly referred to as the African giant is not in any way exempted both in the share of the challenges posed by climate change and its famous global consequence(s) on humanity and the environment. While the argument in support of climate change reality is preponderant, a few minds are still skeptical about it seeing the phenomenon as mere environmentalists' politics against human freedom to access the environment. This view has in no doubt affected the responses to climate change in different jurisdictions. The agitating questions tackled therefore by this paper include: how is climate change concept viewed in Nigeria? How much contribution does Nigeria make to climate change problem, and how has Nigeria responded to the climate change challenges? Using a doctrinal approach, this paper extensively examines the response to climate change in Nigeria, bearing in mind the above thought-provoking questions and many more. The paper argues that, in view of the established scientific proofs of global warming, climate change is now real and should, therefore, be responded to and or addressed with a more proactive and robust action that will not only foster mitigation but also adaptation in Nigeria to save the country's teeming and vulnerable population from its looming effect in this century. The paper concludes with some suggestions.*

## Introduction

In this century, among the threats to human existence, environment and sustainable development on the planet earth, climate change remains one of the greatest challenges. According to the Intergovernmental Panel on Climate Change (IPCC),<sup>1</sup> climatic change, owing to activities of mankind is

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<sup>1</sup> The IPCC is the world's greatest international body for the assessment of climate change. This organization was established in 1988 by the United Nations Environment Programme (UNEP). Its main function among others is to review and assess the most recent scientific, technical and socio-economic information that is worldwide produced and relevant to the understanding of climate change. The organization does not conduct any research neither does it monitor climate related data or parameters on its own; rather, thousands of scientists globally, contribute on a voluntary basis to the work of the IPCC. See IPCC, IPCC Official

predominantly responsible for a rising change in precipitation and increasing sea levels that are varying the overall hydrological systems and impacting on the quality and quantity of water resources all over the globe.<sup>2</sup> The adverse impact of climate change has also been detected in terms of declining agricultural harvests in numerous regions across the world, a trend that raises so much concern about food security for the rising human population.<sup>3</sup> Based on the threats from climate change, as well as daily and or continuous exploitation of the environment by humanity, there is no doubt from all indications that human beings will be forced to mitigate and more essentially, adapt to the impact of a warming planet;<sup>4</sup> and human rights to the environment will continuously and greatly be affected.<sup>5</sup> There is also little doubt that the poorest people in the poorest countries will bear most of the burden of adapting to climate change consequences which they had almost no role in creating.<sup>6</sup>

Mitigation of climate change in Nigeria through enforcement of all local and international climate change laws is one of the principal functions for which the National Environmental Standards and Regulations Enforcement Agency (NESREA) was established since 2007.<sup>7</sup> Nigeria, which is rich in environmental resources, is not only located in Africa but is the giant in the continent by many, if not in all parameters.<sup>8</sup> To that extent, a mention of Africa puts Nigeria in strategic focus especially in any transnational issue and or expedition as in the case of climate change debate. At the global arena, the issue of climate change has more than ever become a hotter debate among pundits including

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Website available at <http://www.ipcc.ch/organization/organization.shtml>, accessed on 3 November 2017.

<sup>2</sup> See IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, Cambridge University Press, Cambridge, 2014, pp.1–32; See also B. Farauta, et.al, ‘Climate Change and Adaptation Measures in Northern Nigeria: Empirical Situation and Policy Implications’, working paper no. 62, African Technology Policy Studies Network, 2011 available at <http://www.atpsnet.org/Files/wps62.pdf>, accessed on 3 November 2017.

<sup>3</sup> Ibid.

<sup>4</sup> Margaux J. Hall & David C. Weiss, ‘Avoiding Adaptation Apartheid: Climate Change Adaptation and Human Rights Law’, vol. 37, *Yale Journal of International Law* p. 309, 2012, p.310.

<sup>5</sup> The environment is part of the gift of nature at human disposal.

<sup>6</sup> R.K. Pachauri & Andy Reisinger (eds), *Climate Change Synthesis Report*, Intergovernmental Panel on Climate Change, 2007.

<sup>7</sup> See generally National Environmental Standards and Regulations Enforcement Agency Act, Nigeria, 2007, s 7.

<sup>8</sup> The metaphor “Giant of Africa” is ascribed to Nigeria specifically because she has the largest population in Africa, a population of over 180 million people. However, the metaphor also applies to the country in other areas such as her military strength, her abundant human and natural resources, her being Africa’s largest university-educated population, and big economy in Africa. See Chinedu Oparah, ‘6 Reasons Why is Nigeria is the Giant of Africa’, *Info Guide Nigeria Official Website* available at <https://infoguidenigeria.com/nigeria-giant-africa/>, accessed on 27 July 2018; See also Abuja-NG, ‘Nigeria-The Giant of Africa’, *Abuja-NG Official Website* available at <https://www.abuja-ng.com/nigeria.html#Nigeria>, accessed on 27 July 2018.

legal scholars since the past few decades. The *raison d'être* for this worldwide concern is not unconnected with the ripple effects of climate change on man and his environment globally in recent times more than the past centuries.<sup>9</sup>

While it appears the argument in support of the reality of climate change is preponderant, given the available scientific evidence, however, there are still sceptics who view the climate change phenomenon as a mere ploy and product of environmentalists being marketed globally against the freedom of Homo sapiens to explore and use the environment at will to his advantage as given by the Creator. This view has in no doubt affected the responses of such sceptics and their followers<sup>10</sup> to climate change. In this global polemic and development, Nigeria is not in any way exempted both in the share of the challenges posed by climate change and its famous global consequence(s) on man and his environment. The agitating questions tackled by this paper include: how is climate change concept viewed in Nigeria? Is climate change real from Nigeria's experience? How many quotas does Nigeria contribute to the climate change problem and how has Nigeria responded to global challenges, and strategies against the climate change phenomenon?

It is the argument in this paper that, in view of the established scientific proofs of global warming,<sup>11</sup> climate change is now real and should, therefore, be responded to and or addressed with a more proactive and robust action that will not only foster mitigation but also adaptation in Nigeria to save the country teeming and vulnerable population from unnecessary but looming catastrophes being occasioned by the climate change menace around the world especially in this century.

## Conceptual Issues

Concepts according to Fagbohun,<sup>12</sup> have been viewed as mental constructs that often shape not only what we are willing to think about, but in addition, how we

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<sup>9</sup> Most of the impact of climate change is directly felt on the environment. This includes floods, drought, high temperature, melting ice etc.

<sup>10</sup> 'Climate change Sceptics vigorously criticize any evidence that supports man-made global warming and yet embrace any argument, op-ed, blog or study that purports to refute global warming. See Skeptical Science, 'Explaining climate change science and rebutting global warming misinformation', *Skeptical Science Official Website* available at <https://www.skepticalscience.com/>, accessed on 3 November 2017. (Various discussions about climate change skepticism).

<sup>11</sup> The term 'global warming' is used to describe a gradual increase in the average temperature of the Earth's atmosphere and its oceans, a change that is believed to be permanently changing the Earth's climate. See Live Science, 'Global Warming: News, Facts, Causes, and Effects', *Live Science Official Website* available at <http://www.livescience.com/topics/global-warming/>, accessed on 3 November 2017.

<sup>12</sup> O. Fagbohun, 'Mournful Remedies, Endless Conflicts and Inconsistencies in Nigeria's Quest for Environmental Governance: Rethinking the Legal Possibilities for Sustainability', Nigerian Institute of Advanced Legal Studies, Lagos, 2012, p.11 available at <http://nials-nigeria.org/PDFs/Prof%20Fagbohun%20Final.pdf>, accessed on 3 November 2017.

proceed to look at what we are willing to think about.” It is therefore important and opposite to understand the relevant concepts that are involved in this paper. This will further provide a good foundation in the discourse.

## Climate and Climate Change

Before discussing the climate change concept, it is crucial to provide an understanding of what ‘climate’ is all about. Climate is often defined as long-term “average weather” in a place. It includes patterns of temperature, precipitation (rain or snow), humidity, wind and seasons over time, at least one hundred years.<sup>13</sup> Climate patterns play a fundamental role in shaping the environment and natural ecosystems, and the human economies as well as cultures that depend on them.<sup>14</sup> Today, the climate we have is not what it used to be, because the past is no longer a reliable predictor of the future in our global village.<sup>15</sup> The global climate is rapidly changing with disruptive and devastating impact on man, and the change is progressing faster than any that is ever recorded in the last two millennia.<sup>16</sup>

According to the US State of Washington, Department of Ecology<sup>17</sup>, the rise in the levels of carbon dioxide and other heat-trapping agents such as gases in the atmosphere have warmed the planet Earth and they are making a wide-range impact, including the rising sea levels; melting snow and ice; more extreme heat events, fires and drought; and more extreme storms, rainfall, and floods. Scientists project that these trends will continue and in some cases accelerate, posing significant risks to human health, our forests, agriculture, freshwater supplies, coastlines, and other natural resources that are vital to ... (sic) economy, environment, and our quality of life.<sup>18</sup>

In light of the foregoing observations, the climate has a profound influence on life that exists on Earth.<sup>19</sup> It dictates the welfare of flora and fauna, the growth rate of

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<sup>13</sup> See Department of Ecology- State of Washington, ‘About climate change’, *Department of Ecology- State of Washington Official Website* available at <http://www.ecy.wa.gov/climatechange/whatis.htm>, accessed on 3 November 2017; See also Exploring Earth, ‘What is climate?’, *Class Zone Official Website* available at [https://www.classzone.com/books/earth\\_science/terc/content/investigations/es2101/es2101page01.cfm](https://www.classzone.com/books/earth_science/terc/content/investigations/es2101/es2101page01.cfm), accessed 3 November 2017. Some other useful factors for describing the climate of a place include the type and the timing of precipitation, amount of sunshine, average wind speeds and directions, number of days above freezing, weather extremes, and local geography.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> See State of Washington Department of Ecology, ‘Preparing for a Changing Climate’ (Publication No. 12-01-004, April 2012, p.3, *State of Washington Department of Ecology Official Website* available on <https://fortress.wa.gov/ecy/publications/publications/1201004b.pdf>, accessed 3 November 2017.

<sup>18</sup> Ibid.

<sup>19</sup> A.P.M, Baede et al, ‘The Climate System: An Overview’ available at [http://www.grida.no/climate/ipcc\\_tar/wg1/pdf/TAR-01.pdf](http://www.grida.no/climate/ipcc_tar/wg1/pdf/TAR-01.pdf), accessed 28 March 2015.

plants and animals, the food animals eat, the adaptation ability as well as their dispositions, and *modus vivendi*<sup>20</sup> among other things.<sup>21</sup> Also, man has always been influenced by climate as he must always live under a climatic condition.<sup>22</sup> Despite the breakthroughs of man in advanced knowledge of technology in modern industrialized societies, climate still affects human well-being in fundamental ways.<sup>23</sup> Specifically, climate influences where people live (shelter), what they eat, how they earn their living, how they move around, and what they do for recreation among others.<sup>24</sup> Climate also regulates food production and water resources. It also influences energy use, disease transmission, and other aspects of human health and well-being. Earth condition is also influenced by climate.<sup>25</sup> Climate is however different from weather which comprises large fluctuations in the atmosphere from hour-to-hour and day-to-day.<sup>26</sup> Weather can also be described as the state of the atmosphere, to the degree that it is hot or cold, wet or dry, calm or stormy, clear or cloudy.<sup>27</sup>

Globally, the overwhelming majority of scientists agree that our globe is undergoing major climatic change.<sup>28</sup> It is also agreed that the level of carbon dioxide in the atmosphere is increasing and or rising significantly.<sup>29</sup> From satellite images and research, we can see that the ice caps are melting faster, our sea levels are rising, and weather patterns are changing.<sup>30</sup> Also, we are experiencing more water shortages and we can see hurricanes, typhoons, and cyclones increasing in ferocity and frequency. The deserts are expanding and the world will ultimately have difficulty growing enough food.<sup>31</sup> No doubt, we must change the way we

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<sup>20</sup> This includes dresses that people wear seasonally or otherwise and the kind of shelter in use.

<sup>21</sup> Ofoezie et al, 'Climate Change and Environmental Challenges in Nigeria' in Egbewole W.O. et al,(eds) *Law and Climate Change in Nigeria*; Faculty of Law, University of Ilorin, Nigeria 2011, p.64.

<sup>22</sup> For instance, the Eskimos use leather as clothes because of the extremely cold climate in their region.

<sup>23</sup> See Pamela A. Matson et al, 'America's Climate Choices: Panel on Advancing the Science of Climate Change,' in National Research Council, *Advancing the Science of Climate Change*, The National Academies Press, Washington D.C, 2010 available at [http://www.nap.edu/openbook.php?record\\_id=12782](http://www.nap.edu/openbook.php?record_id=12782), accessed on 3 November 2017.

<sup>24</sup> Ibid.

<sup>25</sup> Ibid.

<sup>26</sup> Ibid.

<sup>27</sup> Merriam- Webster Dictionary online, 'Weather', available at <http://www.merriam-webster.com/dictionary/weather>, accessed on 03 November 2017.

<sup>28</sup> IPCC's Fourth Assessment Report (AR4) issued in 2007 (Working Group I) which addressed the Physical science basis of climate change.

<sup>29</sup> Ibid.

<sup>30</sup> See Global Greenhouse Warming, 'Global Warming Climate Change Green House Effect', *Global Green House Warming Official Website* available at <http://www.global-greenhouse-warming.com/>, accessed on 3 November 2017.

<sup>31</sup> Ibid.

live, given the change the climate is experiencing.

Now, the question comes, what is climate change? Conceptually, climate change is a change in the statistical distribution of weather over periods of time that range from decades to millions of years. This may be a change in the average weather itself or a change in the distribution of weather events around an average (for example, greater or fewer extreme weather events).<sup>32</sup> Climate change may occur within a specific region or may cut across the whole Earth. Oxford Dictionary<sup>33</sup> of English Language defines climate change as a change in global or regional climate patterns, in particular, a change apparent from the mid to late 20<sup>th</sup> century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels. The most general definition of climate change is a change in the statistical properties of the climate system when considered over periods of decades or longer, regardless of cause.<sup>34</sup> Accordingly, fluctuations on periods shorter than a few decades, such as El Niño,<sup>35</sup> do not connote or represent climate change.

The term “climate change” has also been used to refer specifically to changes caused by human activity in the climate. This represents the standpoint of the United Nations Framework Convention on Climate Change (UNFCCC) which 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.<sup>36</sup> Thus, UNFCCC made a distinction between “climate change” that is attributable to

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<sup>32</sup> See Pamela A. Watson (n 23).

<sup>33</sup> English Oxford Living Dictionaries, ‘Climate Change’, *English Oxford Living Dictionaries Official Website* available at <http://www.oxforddictionaries.com/definition/english/climate-change>, accessed on 3 November 2017.

<sup>34</sup> IPCC Fourth Report (Working group I), ‘The Scientific basis Glossary’, IPCC Official Website available at <http://www.ipcc.ch/ipccreports/tar/wg1/518.htm>, accessed on 3 November 2017.

<sup>35</sup> El Niño-Southern Oscillation is originally warm water current which is periodically flowing along the coast of Ecuador and Peru which often disrupts fishing and or local fishery. This oceanic event or experience is generally associated with a fluctuation of the inter-tropical surface pressure pattern as well as circulation in the Indian and Pacific oceans which is called the Southern Oscillation. This coupled atmosphere-ocean occurrence is collectively referred to as El Niño-Southern Oscillation or ENSO. During this event, the prevailing trade winds become weak while the equatorial counter-current is strengthened, thereby causing warm surface waters in the region of Indonesia to flow eastward to overlie the cold waters of the Peru Current. This event generally has a great impact on the wind, sea surface temperature and precipitation patterns in the region of tropical Pacific. It also has effects on the climatic situation throughout the Pacific region and in many other parts of the world. It should be noted that the opposite of an El Niño event is known as La Niña.

<sup>36</sup> See *United Nations Framework Convention on Climate Change (UNFCCC)*, A/RES/48/189, adopted on 20 January 1994, art 1 available at [http://unfccc.int/key\\_documents/the\\_convention/items/2853.php](http://unfccc.int/key_documents/the_convention/items/2853.php), accessed on 04 November 2017.

anthropogenic activities which alter the atmospheric composition, and “climate variability” that is attributable to natural causes.

Climate change in the IPCC<sup>37</sup> usage refers to a change in the climatic condition that can be identified (for example using statistical tests) by changes in the mean and/or the variables of its properties which persists for an extended period, typically for at least some decades or longer. In this context, climate change could, therefore, refer to any change in climate over time, whether due to natural variability or as a result of human activity.<sup>38</sup> This description of climate change differs from that in the United Nations Framework Convention on Climate Change, where climate change is attributed largely to human activity.<sup>39</sup>

According to IPCC, climate change as studied in the observational record of climate occurs because of internal changes within the climate system or in the interaction between its components, or because of changes in external forcing either for natural reasons or because of human activities. It is generally not possible to clearly make attribution between these causes.<sup>40</sup>

On its part, the World Meteorology Organisation (WMO) viewed climate change as a statistical variation that is significant in either the mean state of the climate or in its variability, which has persisted for an extended period (usually decades or longer). According to WMO, climate change may occur due to natural internal processes or external forces, or due to persistent anthropogenic changes in the composition of the atmosphere or in land use.<sup>41</sup>

Arising from the foregoing definitions or descriptions of climate change, especially that of UNFCCC, it is clear that the climate change problem in addition to other factors related to it, is more of anthropogenic activities that have resulted to changes in the concentration of the greenhouse gases (water vapour, carbon dioxide, methane, nitrous oxide and fluorocarbons), which trap infrared radiation from the Earth’s surface and thus cause the greenhouse effect. This effect is a natural phenomenon, which helps maintain a stable temperature and climate on earth. Human activities, such as fossil fuel combustion, deforestation, and some industrial processes have led to an increase in greenhouse gases concentration.

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<sup>37</sup> See AR4 (n 28).

<sup>38</sup> See United Nations Framework Convention on Climate Change, ‘Fact sheet: Climate change science - the status of climate change science today’, February 2011, p.1 available at [https://unfccc.int/files/press/backgrounders/application/pdf/press\\_factsh\\_science.pdf](https://unfccc.int/files/press/backgrounders/application/pdf/press_factsh_science.pdf), accessed on 3 November 2017.

<sup>39</sup> Ibid p. 2.

<sup>40</sup> IPCC, ‘Climate change: a glossary’, 1995, *IPCC Official Website* available at <http://www.ipcc.ch/pub/gloss.htm>, accessed 18 April 2010.

<sup>41</sup> See World Meteorological Organization’s Commission for Climatology, ‘Climate’, *World Meteorological Organization’s Official Website* available at <http://www.wmo.ch/pages/prog/wcp/ccl/faqs.html>, accessed on 3 November 2017.

Consequently, more infrared radiation has been captured in the atmosphere, which causes changes in the air temperature, precipitation patterns, sea-level rise, and melting of glaciers.<sup>42</sup>

Normally, climate variations, both in the mean state and in other statistics such as the occurrence of extreme events, may result from radioactive forces, and also from internal interactions between components of the climate system.<sup>43</sup> Climate variability is defined as variations in the mean state and other statistics of the climate on all temporal and spatial scales, beyond individual weather events.<sup>44</sup> The term is often used to denote deviations of climatic statistics over a given period of time, for example, a month, season or year when compared to long-term statistics for the same calendar period.<sup>45</sup> Climate variability is measured by these deviations, which are usually termed ‘anomalies’. Variability may result due to natural internal processes within a climatic system (internal variability), or due to variations or changes in natural or anthropogenic external factors (external variability).<sup>46</sup>

Essentially, from the foregoing, climate variability focuses on changes that occur within the smaller time frame, such as a month, a season or a year, and climate change considers changes that occur over a longer period of time, typically over decades or longer. Care must, therefore, be exercised not to confuse climate variability with climate change. The major difference between climate variability and climate change is in the persistence of “anomalous” conditions - when events that used to be rare occur more frequently, or vice-versa. From a climatological perspective, some regions of the world experience greater variability than the others.<sup>47</sup> The variability can be weak (i.e. there is not much difference in the conditions within that time period) in some parts of the world or in any region for certain periods or parts of the year. However, in other places or time, the conditions may swing across a large range, from freezing to very warm, or from very wet to very dry and exhibit strong variability.<sup>48</sup> Thus, any single event, such as a severe tropical cyclone, cannot be attributed to human-induced climate change. Once in a while, an event may occur that has never been witnessed before or recorded before, such as the exceptional hurricane season in the Atlantic in 2005. Only a persistent series of unusual events taken in the context of regional climate parameters can suggest a potential change in climate has occurred.<sup>49</sup>

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<sup>42</sup> Ibid.

<sup>43</sup> See A.P.M Baede (n19).

<sup>44</sup> See World Meteorological Organization’s Commission for Climatology (n41).

<sup>45</sup> Ibid.

<sup>46</sup> Ibid.

<sup>47</sup> Ibid.

<sup>48</sup> Ibid.

<sup>49</sup> Ibid.

One of the first scientists to use simple climate models to predict future global temperature changes was Professor Wallace Smith Broecker in his paper “Climate Change: Are we on the Brink of a Pronounced Global Warming?,” published in 1975.<sup>50</sup> Broecker was widely credited with coining the term “Global Warming”. The term was more popularised when Dr. James E. Hansen<sup>51</sup> appeared before the Energy and Natural Resources Committee of the United States Senate on the 23<sup>rd</sup> June 1988, to testify about his certainty that the recorded high temperatures were the result of human activities.<sup>52</sup> Hansen stated “Global warming has reached a level such that we can ascribe with a high degree of confidence and effect relationship between the greenhouse effect and the observed warming” His testimony made headlines in the New York Times the next day declaring that Global Warming had begun.<sup>53</sup> Before this celebrated affirmation, scientists had been cautious about attributing rising global temperatures of recent years to the predicted global warming caused by pollutants in the atmosphere, known as the “greenhouse effect.” But Hansen told a Congressional committee that it was now 99 percent certain that the warming trend was not a natural variation but was caused by a build-up of carbon dioxide and other artificial gases in the atmosphere.<sup>54</sup>

Against this backdrop, Global Warming as it is widely accepted today is the increase of Earth’s average surface temperature owing to the effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels or from deforestation, which trap heat that would otherwise escape from Earth.<sup>55</sup> Global warming is mainly a problem of too much carbon dioxide in the atmosphere, which acts as a blanket, trapping heat and thereby warming the planet.<sup>56</sup> As we daily and consciously or otherwise burn fossil fuels like coal, oil and natural gas for energy and or cut down and burn forests to create pastures and plantations, carbon accumulates and overloads in our atmosphere. Again, certain waste

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<sup>50</sup> See Wallace S. Broecker, ‘Are We on the Brink of a Pronounced Global Warming?’, vol. 189 no., 4201, *Science* 460, 1975 available at <http://blogs.ei.columbia.edu/files/2009/10/broeckerglobalwarming75.pdf>, accessed on 04 November 2017.

<sup>51</sup> Hansen was a director of NASA’s Institute for Space Studies in Manhattan when he testified before the US Senate Energy and Natural Resources Committee.

<sup>52</sup> See C.I. Okpara, ‘Toward a Regulatory Framework for Combating Global Warming in Nigeria’ in Uchefula Chukwumaeze et al. (eds) *Law, Social Justice and Development – A Festschrift for Professor Uba Nnabue*, Imo State University Press, Owerri, 2013, p.677.

<sup>53</sup> Ibid; See also P. Shabecoff ‘Global Warming has begun, Expert tells Senate’, *New York Times*, New York, 24 June 1988 available at <http://www.nytimes.com/1988/06/24/us/global-warming-has-begun-expert-tells-senate.html>, accessed on 4 November 2017.

<sup>54</sup> Ibid.

<sup>55</sup> See ‘Fossil Fuels and Global Warming’ available at [http://www.nmsea.org/Curriculum/Primer/Global\\_Warming/fossil\\_fuels\\_and\\_global\\_warming.ht](http://www.nmsea.org/Curriculum/Primer/Global_Warming/fossil_fuels_and_global_warming.ht), accessed on 29 March 2015.

<sup>56</sup> See Climate Hot Map, ‘Global Warming Causes’, *Climate Hot Map Official Website* available at <http://www.climatehotmap.org/about/global-warming-causes.html>, accessed on 29 March 2015.

mismanagement and agricultural practices exacerbate the problem by releasing other potent global warming gases, such as methane and nitrous oxide.<sup>57</sup>

Carbon dioxide (CO<sub>2</sub>) has been proved to survive in the atmosphere for a very long period of time, even up to many centuries, such that its heat-trapping effects are compounded over time. From the list of many heat-trapping gases, CO<sub>2</sub> puts us at the greatest risk of irreversible changes if it continues to accumulate unabated in the atmosphere. This risk will persist if the global economy remains dependent on fossil fuels for its energy needs. The conclusion, therefore, is that the carbon we emit into the atmosphere today will definitely determine not only our climate presently but in addition, the nature of the climate for the generations yet unborn.<sup>58</sup>

### The Realism of Climate Change

According to Churchill Winston, “they go on in strange paradox, decided only to be undecided, resolved to be irresolute, adamant for drift, solid for fluidity, all-powerful to be impotent... Owing to past neglect, in the face of the plainest warnings, we have entered upon a period of danger. The era of procrastination, of half measures, of soothing and baffling expedience of delays, is coming to its close. In its place, we are entering a period of consequences... We cannot avoid this period, we are in it now”.<sup>59</sup>

The above comment by Churchill is a good description of the situation with the climate change skeptics in their deliberate insensitiveness, refusal and or negligence by not admitting and or facing the reality of climate change in order to scuttle global efforts at bequeathing to the coming generation, a congenial planet.

According to the National Aeronautics and Space Administration (NASA)<sup>60</sup>, the Earth’s climatic condition has changed throughout human history. In the past 650,000 years or thereabout, there have been seven cycles of glacial advance and retreat, with the abrupt end of the last ice age, about 7,000 years ago which marked the beginning of the modern climate era and civilization of man. Most of these climate changes are attributable to very small variations in the Earth’s orbit which affect the amount of solar energy which our planet receives.<sup>61</sup>

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<sup>57</sup> Ibid.

<sup>58</sup> Ibid.

<sup>59</sup> Speech of W. Churchill, ‘The Locust Years’, House of Commons, United Kingdom, 12 November 1936 available at <http://www.churchill-society-london.org.uk/Locusts.html>, accessed on 4 November 2017.

<sup>60</sup> The National Aeronautics and Space Administration (NASA) is the United States’ government agency responsible for the civilian space program as well as aeronautics and aerospace research.

<sup>61</sup> See NASA, ‘Global Climate Change-Vital Signs of the Planet’, *NASA Official Website*

In the findings of IPCC in its recent report, warming of human climatic system is unequivocal, and as far back as the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have experience more warming, the amount of snows and ices have drastically diminished, and sea level has also risen.<sup>62</sup> Globally, the current warming trend is momentous given the facts that most of the changes are likely human-induced and have proceeded at a rate that is unprecedented in the past 1,300 years according to NASA.<sup>63</sup> Scientists have been able to view through earth-orbiting satellites and other technological equipment with ease the big picture, collecting different types of information about the planet, earth as well as its climate on a global scale. From the studies of these climate data collected over many years, it has been revealed that there are signals of a changing climate.<sup>64</sup>

The manner by which carbon dioxide and other gases trap heats was demonstrated in the mid-19th century.<sup>65</sup> The scientific basis of many instruments flown by NASA is the ability of this carbon dioxide and other gases to affect the transfer of infrared energy through the atmosphere. There is no question that increased concentrations of greenhouse gases are the basis for the increase in the manner the Earth warm in response.<sup>66</sup> Also, ice cores drawn from Greenland,<sup>67</sup> Antarctica,<sup>68</sup> and Tropical Mountain glaciers show that the Earth's climate responds to changes in greenhouse gas levels. They also reveal that large changes in climatic condition have happened in the past very quickly. Geologically-speaking, this has happened in tens of years, and not only in millions or even thousands.<sup>69</sup>

Today, at least ninety-seven percent (97%) of the world climate scientists have

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available at <http://climate.nasa.gov/evidence/>, accessed on 4 November 2017.

<sup>62</sup> IPCC, 'Climate Change Synthesis Report', 2014, p.2, IPCC Official Website available at [http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5\\_SYR\\_FINAL\\_SPM.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf), accessed 4 November 2017. The Synthesis Report is based on the reports of the three Working Groups of the IPCC. This also includes relevant Special Reports. It provides an integrated view of various scientists about climate change as the final part of the IPCC's Fifth Assessment Report.

<sup>63</sup> See NASA (n 61).

<sup>64</sup> Ibid.

<sup>65</sup> Ibid. Physicist John Tyndall in the 1860s recognized or discovered the Earth's natural greenhouse effect. This Physicist also suggested that any slight change in the composition of the atmosphere could occasion climatic variations. Also, a seminal paper delivered by Swedish scientist Svante Arrhenius in 1896 first speculated that any change in the levels of carbon dioxide in the atmospheric composition could significantly affect or alter the surface temperature through the effect of a greenhouse.

<sup>66</sup> Ibid.

<sup>67</sup> The largest island in the world; lies between the North Atlantic and the Arctic Ocean. It is a self-governing province of Denmark.

<sup>68</sup> An extremely cold continent at the South Pole almost entirely below the Antarctic Circle. It is covered by an ice cap up to 13,000 feet deep.

<sup>69</sup> See National Research Council, *Surface Temperature Reconstructions For the Last 2,000 Years*, National Academy Press, Washington, DC., 2006; NASA (n 61).

now agreed that the rapid warming trends being experienced in the climatic condition in the past century are very strongly traceable to human activities.<sup>70</sup> Most of the leading scientific organizations worldwide have to that extent issued public statements endorsing this unequivocal perspective. For certainty and avoidance of doubt, below some of these organizations and a selection of related resources from their published statements:<sup>71</sup>

According to 18 Scientific Associations in the USA<sup>72</sup> in their statement on climate change in 2009, worldwide observations have made it clear that climate change is real and occurring. In addition, in-depth scientific research depicts and or demonstrates that the greenhouse gases emitted as a result of anthropogenic activities are primarily the driver.<sup>73</sup> The American Association for the Advancement of Science (AAAS) in 2006 also states as follows: There is clear scientific evidence that global climate change which is caused by human activities is happening now, and is indeed a growing threat to all human society.<sup>74</sup>

The American Chemical Society (ACS) in 2004 on climate change states that, the assessments in a comprehensive and scientific manner of human current, as well as potential future climates, indicate clearly that climate change is real, and this is largely traceable and or attributable to emissions from human activities which are potentially a very serious problem.<sup>75</sup>

American Meteorological Society (AMS) in 2012 concludes that, it is very clear from extensive and profound scientific inquiries and evidence that the dominant or

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<sup>70</sup> W. R. L. Anderegg et al, 'Expert Credibility in Climate Change', vol. 27, PNAS 2010, p.12107-12109; See also P. T. Doran and M. K. Zimmerman, 'Examining the Scientific Consensus on Climate Change', vol. 90, no. 3, *Eos Transactions American Geophysical Union*, 2009, p. 22. Culled from NASA <<http://climate.nasa.gov/scientific-consensus/>> accessed 4 November 2017.

<sup>71</sup> See NASA, 'Scientific Consensus', NASA Official Website available at <http://climate.nasa.gov/scientific-consensus/>, accessed on 4 November 2017.

<sup>72</sup> These associations are: Organization of Biological Field Stations, American Association for the Advancement of Science, American Statistical Association, Society of Systematic Biologists, Botanical Society of America, Soil Science Society of America University, American Geophysical Union, American Institute of Biological Sciences, American Meteorological Society, American Society of Agronomy, Natural Science Collections Alliance, American Society of Plant Biologists, American Chemical Society, Association of Ecosystem Research Centers, Crop Science Society of America, Ecological Society of America, Society for Industrial and Applied Mathematics, and Corporation for Atmospheric Research.

<sup>73</sup> See AAAS, 'Climate Letter', *AAAS Official Website* available at [http://www.aaas.org/sites/default/files/migrate/uploads/1021climate\\_letter1.pdf](http://www.aaas.org/sites/default/files/migrate/uploads/1021climate_letter1.pdf), accessed on 4 November 2017.

<sup>74</sup> See AAAS, 'AAAS Board Statement', 9 December 2006, AAAS Official Website available on [http://www.aaas.org/sites/default/files/migrate/uploads/aaas\\_climate\\_statement.pdf](http://www.aaas.org/sites/default/files/migrate/uploads/aaas_climate_statement.pdf), accessed on 4 November 2017.

<sup>75</sup> See ACS, 'Global Climate Change', ACS Official Website available on <http://www.acs.org/content/acs/en/policy/publicpolicies/promote/globalclimatechange.html>, accessed on 30 March 2015.

major cause of the change in climate that is now rapid in the past half a century is human-induced increases or multiplication in the amount of greenhouse gases in the atmosphere, including carbon dioxide (CO<sub>2</sub>), methane, chlorofluorocarbons, and nitrous oxide.<sup>76</sup>

From the American Physical Society (APS) is this statement on climate change in 2007, evidence that is available that global warming is happening is incontrovertible. Except there are mitigating actions globally, the Earth's physical composition and ecological systems, as well as social systems such as security and human health are likely to be significantly disrupted. This is the time we must reduce emissions of greenhouse gases.<sup>77</sup>

In its statement, the International Science Academies opines that climate change is real even though there is always some uncertainties in the understanding of a system that is as complex as the world's climatic system. There is however now some strong evidence that significantly attests to the fact that there is global warming. Some of these pieces of evidence come directly from the measurements carried out on the rising surface air temperatures and subsurface ocean temperatures and from other phenomena such as an increase in the global sea levels average, retreating glaciers, and other noticeable changes to many biological and physical systems. Global warming in recent decades is likely attributable to human activities.<sup>78</sup>

Also in its statement in 2010, The Geological Society of America states that, it concurs with National Academies of Science's assessments in 2005, the National Research Council's assessments in 2006, as well as that of the Intergovernmental Panel on Climate Change in 2007 that global climate has warmed or is warming and that human activities especially the greenhouse-gas emissions is the cause of most of the warming since the middle 1900s.<sup>79</sup>

The Department of Climate Change, Federal Ministry of Environment, Abuja, Nigeria has this to say: climate change has become a critical issue, both for its global importance and threats to Nigeria and her people. For instance, we

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<sup>76</sup> See AMS, 'An Information Statement of the American Meteorological Society', 20 August 2012, AMS Official Website available at <http://www.ametsoc.org/policy/2012climatechange.pdf>, accessed on 30 March 2015.

<sup>77</sup> APS, 'National Policy on Climate Change', 18 November 2007, *APS Official Website* available on [http://www.aps.org/policy/statements/07\\_1.cfm](http://www.aps.org/policy/statements/07_1.cfm), accessed on 4 November 2017.

<sup>78</sup> International science academies' statement, 'Global response to climate change', 2005, *National Academies Official Website* available on <http://nationalacademies.org/onpi/06072005.pdf>, accessed on 30 March 2015.

<sup>79</sup> The Geological Society of America, 'GSA's statement on Climate change', October 2006, *The Geological Society of America Official Website* available at <http://www.geosociety.org/positions/position10.htm>, accessed on 30 March 2015.

have the desertification process advancing southward and potential submergence of the 853 kilometers stretch of coastline along the Atlantic Ocean. For these and many other reasons, we cannot but continue to implement (sic) the Climate Change Convention, related Kyoto Protocol and our local efforts and initiatives at combating the threats of climate change and warnings of global warming. There is no gainsaying, there will be some changes in climate that cannot be avoided due to past and inevitable future global emissions, but the detrimental effects can be avoided if we can reduce pollution to an acceptable level. Therefore, we must move beyond thinking about climate change and global warming, to take action as a nation. Since taking actions that will alleviate the effects of climate change and a warmer world is everyone's responsibility, we will be interacting and working with the general public, individuals, communities, businesses and (sic) industries, international partners and the global community.<sup>80</sup>

From the above scientific various findings, comments and or statements, including that of the Nigerian Federal Ministry of Environment, it is clear that climate change is real and Nigeria as a country has keyed into this global reality. It is therefore no safer but rather an absurdity for any reasonable human to exercise any unfounded skepticism about the reality of climate change. At this point, it is the opposite to examine tersely, the proofs of climate change based on the findings of IPCC.

### **Accessing Nigeria's Contribution to Climate Change**

As earlier noted, Nigeria is a notable country in Africa. The country is experiencing adverse climatic conditions with a negative impact on the lives and wellbeing of her teeming population.<sup>81</sup> Regular flooding, droughts, ocean surge, off-season rains, and dry spells have sent growing seasons out of order in a country that is dependent on rain-fed agriculture.<sup>82</sup> While Nigeria is sharing in the worst hits by the effects of climate change on Africa as projected by scientists,<sup>83</sup> the country is still contributing to the exacerbation of the problem of climate change in no small measure on daily basis in the region. Nigeria ranks as Africa's largest producer of oil and the sixth largest oil producing country in the world.<sup>84</sup> The country also

<sup>80</sup> S.A. Adejuwon's Welcome Note, *Department of Climate Change Official Website* available at <http://climatechange.gov.ng/index.php/component/content/article/92-all-articles/111-a-welcome-note-from-the-head-dna>, accessed on 30 March 2015.

<sup>81</sup> N.Medugu Idris, 'The Effects of Climate Change in Nigeria', 18 April 2011, *Environmental Synergy Official Website* available at <https://environmentalsynergy.wordpress.com/2011/04/18/the-effects-of-climate-change-in-nigeria/>, accessed 4 November 2017.

<sup>82</sup> Ibid.

<sup>83</sup> See various IPCC Reports till date which have all projected impact that climate change will have on Africa.

<sup>84</sup> See Nigerian National Petroleum Corporation, 'Oil Production', *Nigerian National*

appears to have a greater potential for gas than oil.<sup>85</sup> Nigeria's gas production as of the year 2000 was approximately 1,681.66 billion scf. The 1,3715 billion scf was associated with gas and the rest 310.16 billion was non-associated gas.<sup>86</sup> Nigeria's oil and natural gas resources are the mainstay of the country's economy. The International Monetary Fund (IMF) estimates that oil and natural gas export revenue accounted for 96% of total export revenue in 2012.<sup>87</sup>

Despite longstanding global campaign against the practice of gas flaring, that is, the burning of natural gas during oil extraction, the activity continues unabated with serious health consequences for people living in the oil-producing Niger Delta of Nigeria.<sup>88</sup> Nigeria has been a major unrepentant gas waster by flaring gas continuously. The country remains the second largest offending country next to Russia, in terms of the total volume of gas flared.<sup>89</sup> In Nigeria, a chunk of the gas associated with crude oil extracted is flared.<sup>90</sup> According to Chris Cragg, an independent oil and gas expert who undertook the environmental impact of oil pollution in the Niger Delta, gas flaring is one of the largest single pointless emissions of greenhouse gas on the planet, with obvious implications for climate change that will not only affect Nigeria, but also the rest of the world.<sup>91</sup>

One keeps wondering why Nigeria refused and or neglected to convert her wastage in gas to wealth despite the global clamour for same and much more,

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*Petroleum Corporation Official Website* available at <http://www.nnpcgroup.com/NNPCBusiness/UpstreamVentures/OilProduction.aspx>, accessed on 04 November 2017.

<sup>85</sup> Nigeria has the largest natural gas reserves on the continent in Africa and was the world's fourth leading exporter of liquefied natural gas (LNG) in 2012. See Energy Information Administration, 'Nigeria Energy Profile: Largest Oil Producer in Africa and World's Fourth-Largest Exporter of LNG- Analysis', 8 May 2016 available at <http://www.eurasiareview.com/31122013-nigeria-energy-profile-largest-oil-producer-africa-analysis/>, accessed on 12 April 2015.

<sup>86</sup> See Nigerian National Petroleum Corporation (n 84).

<sup>87</sup> See Energy Information Administration (n 85).

<sup>88</sup> IRIN, 'Gas Flares still a burning issue in the Niger Delta', 8 March 2012, *IRIN Official Website* available at <http://www.irinnews.org/report/95034/nigeria-gas-flares-still-a-burning-issue-in-the-niger-delta>, accessed on 12 April 2015.

<sup>89</sup> See Environmental Rights Action/Friends of the Earth Nigeria, 'Fact Sheet: Harmful Gas Flaring in Nigeria', 2008, p.2, *Friends of the Earth Official Website* available at [www.foe.org/pdf/GasFlaringNigeria\\_FS.pdf](http://www.foe.org/pdf/GasFlaringNigeria_FS.pdf), accessed on 1 July 2015; Justice in Nigeria Now, 'Gas Flaring in Nigeria: an Overview', April 2010, p. 2, *Justice in Nigeria Now Official Website* available at [www.justiceinnigerianow.org/inn-wp-content/uploads2010/04/JINN-2010-Gas-Flaring-an-Overview.pdf](http://www.justiceinnigerianow.org/inn-wp-content/uploads2010/04/JINN-2010-Gas-Flaring-an-Overview.pdf), accessed on 1 July 2010.

<sup>90</sup> Ibid; See also N. Basse, 'Gas Flaring: Assaulting Communities, Jeopardizing The World', *National Environmental Consultation*, Environmental Rights Action and the Federal Ministry of Environment, Abuja, April 2010 available at <http://www.eration.org/publications/presentations-gasflaring=ncc-abuja.pdf>, accessed on 5 July 2010.

<sup>91</sup> Ibid; See Howden D., 'Environmental Racism: The Gas Flares that Bring Death and Destruction to Nigeria', *Elombah News* available at [http://www.elombah.com/index.php?option=com\\_content&view=article&id=3447:environmental-racism-the-gas-flares-that-bring-death-and-destruction-to-nigeria&catid=30:the-economy&Itemid=4](http://www.elombah.com/index.php?option=com_content&view=article&id=3447:environmental-racism-the-gas-flares-that-bring-death-and-destruction-to-nigeria&catid=30:the-economy&Itemid=4), accessed on 5 July 2010.

the fact that Nigerians need gas for power generation and domestic use instead of leaving people to primitive domestic energy sources such as charcoals and firewood among others which in turn cause a lot of damage to the environment. Deforestation is on increase in Nigeria because of ‘slash and burns’ for domestic energy for cooking some local small companies. Till date, the country has no stable electricity supply which the use of gas could provide if so harnessed. However, some of the reasons provided include: firstly, domestic demand for natural gas was low and could not utilize all the associated gas, if recovered; secondly, the price tag on recovery of associated gas happened to be much higher than that of non-associated gas and that Nigeria has inadequate domestic gas infrastructure to distribute gas to potential consumers.<sup>92</sup> All these are no tenable excuse for global environmental damage being occasioned by gas flaring.

The Photographs below are instructive in explaining the reality and continuous gas flaring in Nigeria.



Figure 4.0: Photographs show day and night gas flaring activities in the Niger Delta oil producing region of Nigeria.

Source: O. Okafor ‘Environmental Laws and the factors affecting them in Nigeria- Case Study of Gas flaring Laws in Niger Delta Nigeria’ being a Thesis Report submitted to The Environmental Policy Group, Environmental Sciences, Wageningen University, in partial fulfilment of the

<sup>92</sup> F.I. Ibitoye, ‘Ending Natural Gas Flaring in Nigeria’s Oil Fields’ vol. 7, no. 3, *Journal of Sustainable Development*, 2014, p.13 available at <http://www.ccsenet.org/journal/index.php/jsd/article/download/33951/20262>, accessed on 04 November 2017.

requirement for the award of Master of Science (MSc) Degree, September 2011.<sup>93</sup>

In Nigeria, one of the major problems associated with crude oil production is gas flaring.<sup>94</sup> Gas flaring emissions contribute significantly to global warming. The emissions are produced when extra gases are burned off during the oil production process. Gas flares are essentially composed of toxic gases such as sulphur dioxide, nitrogen dioxides, benzapryene, toluene, xylene, and hydrogen sulphide which are all destructive not only to the health of the people but also worsen climate change problem.<sup>95</sup>

In the Niger Delta of Nigeria, there are over 100 gas flaring sites which continuously emit greenhouse gases day and night thereby aggravating the problem of climate change and health damages not only to the immediate inhabitants of the region but also the entire Africa since the environment is transnational in nature.<sup>96</sup> The various sites in the region of Niger Delta have the flaring points since the 1960s. As the activities of oil production increase annually in Nigeria, the volume of gas and the rate at which gas is flared increases as well.<sup>97</sup> According to Al-Blaies,<sup>98</sup> Nigeria flared a total of 15.2 billion cubic meters of gas in 2010, the second largest in the world.

As earlier remarked, the effect of gas flaring on the climate system is now alarming, given the various IPCC reports. Although there is no official data stipulating the exact amount of gas flaring in Nigeria, it has been reported that Nigeria flares over 70% of the gases it produces on daily basis.<sup>99</sup> No wonder it is reported that Nigeria's gas flaring produces almost 25% of Africa's greenhouse gases.<sup>100</sup> Due to the high emission rate therefore, the impact of the flared gases is substantial in Nigeria and Africa.

On a global scale, gas flaring is a big contribution to global warming and or climate change problems ravaging the global environment. In this adverse enterprise, Nigeria is a great player, given the activities of gas flaring in her all-

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<sup>93</sup> Obinna Okafor, 'Environmental Laws and Factors Affecting them in Nigeria: Case Study of Gas Flaring Laws in Niger Delta', Academia Official Website available at [https://www.academia.edu/1009029/ENVIRONMENTAL\\_LAWS\\_AND\\_FACTORS\\_AFFECTING\\_THEM\\_IN\\_NIGERIA\\_CASE\\_STUDY\\_OF\\_GAS\\_FLARING\\_LAWS\\_IN\\_NIGER\\_DELTA](https://www.academia.edu/1009029/ENVIRONMENTAL_LAWS_AND_FACTORS_AFFECTING_THEM_IN_NIGERIA_CASE_STUDY_OF_GAS_FLARING_LAWS_IN_NIGER_DELTA), accessed on 04 November 2017.

<sup>94</sup> E. Ukala, 'Gas Flaring in Nigeria's Niger Delta: Failed Promises and Reviving Community Voices', vol. 2, *Wash. & Lee J. Energy, Climate, & Env't*, 2011, p.100-101.

<sup>95</sup> Ibid.

<sup>96</sup> Obinna Okafor (n 93).

<sup>97</sup> Ibid.

<sup>98</sup> W. Al-Blaies, 'Saudi Aramco's Flares Minimisation program', 7<sup>th</sup> Gas Arabia Summit, Muscat Oman, 11-14<sup>th</sup> December 2011.

<sup>99</sup> E. Ukala (n 94).

<sup>100</sup> See UN Integrated Regional Information Networks, 'Should Stopping Gas Flaring be a Priority?', 3 September 2008.

important oil industry. The most challenging aspect of this gas flaring problem is that, being an oil and gas related matter, the regulation and management is vested on the Directorate of Petroleum Resources (DPR) and not on NESREA which is the Nigeria's chief 'environmental manager' whose mandates also include enforcement of all climate change laws, locally and internationally.<sup>101</sup>

Another notable source of contribution to the climate change problem in Nigeria is bush-burning. The negative impact of bush burning cannot be over-emphasized in Nigeria, especially in the middle belt and northern Nigeria. Bush burning is usually carried out in an indiscriminate and haphazard manner during the dry season either by hunters looking for games or farmers who use it as means of regenerating grazing land. Also, the Fulani herdsmen are fond of burning bush to facilitate the growth of new grasses to feed their cattle prior to the advent of the raining season in the country. This practice is ubiquitous in Nigeria without definite action against it and has gradually become a nationwide environmental problem.<sup>102</sup> In addition, in southern Nigeria, where we have rain forests, the farmers in an attempt to cultivate lands for their crops are also in the habit of bush burning. After cutting the forest, they set it on fire. Most times, the fire escalates and burn bushes around and even damages their crops such as cocoa and Kola nut plantations. Bush burning ravages the environment by emitting and releasing a lot of carbon dioxide (a Greenhouse gas) into the atmosphere.<sup>103</sup>

Apart from environmental pollution and health hazards, bush burning obviously causes immense catastrophes in many quarters. The smoke depletes the ozone layer of the environment.<sup>104</sup> It also destroys vegetation, wildlife, aquatic life, and breeding sites. It reduces the chemistry of the soil and causes soil erosion. It destroys the oxygen cycle, reduces food crops and is dangerous for all living things in our surrounding and in addition, it causes many deadly diseases.<sup>105</sup>

In Nigeria, burning of refuse is also a common scene, especially in the cities. As earlier noted, it is also laughable that even government agencies in the health sector are not left out of the unfriendly environmental practices. Government agencies such as the National Agency for Food and Drug Administration and Control (NAFDAC) and Nigeria Customs Service are fond of burning seized goods from time to time in an attempt to get rid of them. Those goods when burnt

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<sup>101</sup> National Environmental Standards and Regulations Enforcement Agency Act (n 7) ss 7-8. (which deal with the functions and powers of the Agency).

<sup>102</sup> B. Ojeleye, 'Bush Burning and Sustainable Beekeeping in Nigeria', *Honey Stakeholders' Forum*, Abuja, 19 June 2013 available at <http://profitablebeekeeping.org/?p=184>, accessed on 19 April 2017.

<sup>103</sup> Ibid.

<sup>104</sup> See H. Idris, 'Nigeria: The Menace of Bush Burning' Daily Trust (16 March 2008) available at <http://allafrica.com/stories/200803171177.html>, accessed on 19 April 2015.

<sup>105</sup> B. Ojeleye (n 102).

emit a lot of carbon monoxide (greenhouse gas) to the atmosphere.

Old and rickety automobiles such as cars, buses, trucks, and trains are common on Nigeria's highways and railways. These vehicles use fossil fuels and they emit smoke that has high concentrations of greenhouse gases. Again, because of the power shortage in Nigeria, a lot of industries such as telecommunication industry depend mainly on generators to power their equipment. Many households also live on generators as a source of energy for domestic needs. All these generating plants are fossil fuel-based. The use of charcoals and burning of woods (slash and burn) to generate charcoals for a domestic source of energy for cooking is also rampant in the Nigerian society. They all emit substantial greenhouse gases to the atmosphere in their numbers, which all aggravate the problem of climate change. From the foregoing, and from all indications, Nigeria's contribution to climate change is indeed great in the African region.

### **Nigeria's Response to Climate Change Challenges and Global Strategies against Climate Change**

It is commendable that the Nigerian government has set up a befitting institution in NESREA with mandates which include addressing climate change problem through enforcement of all international laws, conventions, protocols, and treaties among others relating to climate change for the purposes of keeping global best practices in the management of the human environment. Section 7(c) of the NESREA Act empowers NESREA to enforce all environmental and climate change related laws in Nigeria either municipal or international. The setting up of NESREA with such mandate is *ex facie* a good response to the climate change challenges and one of the viable national strategies against the threats. However, in one of the author's visit to NESREA's headquarters in Abuja, he was orally informed during interview with the official that the agency currently has less than 2000 staff to manage climate change problem in particular and environmental challenges generally in a country with over 180 million people stretched across a total land area of 923,768 square kilometers.

Also, Nigeria's response to the challenge and global strategies against climate change is also better understood from the perspective that Nigeria is at all times signatory to many if not all relevant international agreements and treaties on the environment generally, and climate change, in particular,<sup>106</sup> the enforcement of which is all NESREA's duty.

A brief remark about Nigeria's responsibility will explain the expected response

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<sup>106</sup> Such Treaties include The *United Nations Convention on Climate Change (UNFCCC)*, *Kyoto Protocol* etc.

to global strategies against climate change. Being a Party to the UNFCCC, Nigeria has agreed to the provisions of the Convention, which requires all parties to-

- I. Ensure the formulation, implementation, and publication, and to regularly update the national as well as where necessary the regional programmes which among other things contain the measures to facilitating adequate climate change adaptation<sup>107</sup>
- II. Ensure they cooperate in the preparation of climate change impact's adaptation; developing and elaborating on the appropriate and integrated plans for the management of coastal zone, water resources, and agriculture, and for the protection and rehabilitation of areas which are particularly in Africa, affected by drought, desertification, and floods.<sup>108</sup>
- III. Bearing in mind climate change, employ appropriate methods to the extent feasible in their relevant social, economic and environmental policies and actions, for example, impact assessments formulated and determined nationally, to minimize adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change.<sup>109</sup>

The major global strategies against climate change are reflected in the UNFCCC Articles as enunciated above. These basically include 'mitigation' and 'adaptation'. For many decades, global political efforts toward addressing climate change concentrated mainly on mitigation of the phenomenon. In other words, the efforts were geared toward how to slow down, stop, or reverse climate change by reducing the GHG emissions that cause it.<sup>110</sup> Mitigation efforts have generally taken place at the international and state levels and have been targeted at diminishing the requisite conditions for climate change.<sup>111</sup>

One of the major efforts on mitigation is the Kyoto Protocol. Since the advent of the Kyoto Protocol, which brought climate change to the world political arena in the late 1990s, the global focus has been on mitigation of global warming. Kyoto Protocol offered a global framework to reduce emissions of GHGs such as carbon dioxide and methane that are heightening the atmosphere's ability to trap and store heat.<sup>112</sup> All along, mitigation has been the focal point of many crucial

<sup>107</sup> UNFCCC (n 36) art 4.1(b).

<sup>108</sup> Ibid art 4.1(e).

<sup>109</sup> Ibid art 4.1 (f).

<sup>110</sup> Hall M. J. & Weiss D.C (n 4) p. 315.

<sup>111</sup> Ibid.

<sup>112</sup> See Climate Change Economics, 'Climate Change Mitigation and Adaptation', available at [http://climatechangeecon.org/index.php?option=com\\_content&task=view&id=18&Itemid=22](http://climatechangeecon.org/index.php?option=com_content&task=view&id=18&Itemid=22), accessed 4 November 2017.

and often contentious issues such as: How can we reduce emissions? How much should be reduced, and how rapidly? Which countries have the greatest obligation to reduce emissions? Will reduction efforts be effective at all? How much will reductions cost, and who should pay for them?<sup>113</sup>

However, in recent times, years after the Kyoto Protocol, the seemingly preponderant efforts now is that human populations will have to do more than mitigate climate change. If the environment must remain congenial for humans, an adaptation strategy must be formidably promoted to tackle the effects of climate change, which is primarily global warming among other expected adverse effects of the change. Adaptation, therefore, entails designing and instituting policies and programs to respond to the inevitable effects of climate change.<sup>114</sup> While mitigation addresses shaping human behavior to reduce the level and causes of climate change, viz, GHG emissions, adaptation efforts, on the other hand, rely upon the ability of species, ecosystems, and socio-ecological systems to respond to on-going changes in the climate system and to minimize the effects.<sup>115</sup>

The question now is, to what extent has NESREA acted within its mandates to promote not only mitigation but adaptation in Nigeria? While Nigeria has evinced an intention to join the comity of nations in mitigating climate change and its effects of global warming by the voluntary signatory to the relevant legal efforts<sup>116</sup> toward the reduction of GHGs emissions, the country has not taken any proactive step toward practical enforcement of mitigation processes, let alone adaptation to climate change. The freelance misuse of the environment and all forms of environmentally unfriendly emissions are still very much extant in Nigeria. There has been no definite enforcement by NESREA to actualize curbing climate change by checkmating the excesses of environmental rascality especially among the Nigerian opulent. GHGs emissions are steady in Nigeria through gas flaring, vehicular emissions, generating set uses, bush-burning and waste burning instead of recycling, and use of dangerous chemicals, among others.

On climate change impact, for instance, across Nigeria especially in cities like Lagos which is the commercial hub of the country, there is a regular flood, abnormal heat, polluted air, sporadic ocean surge, and most times abnormal rainfalls that often displace the populace in large number. Painfully, rather than strategizing on adaptation to this notable looming impact of climate change in the coastal city, the Lagos *élite* has been disturbing, for instance, the ocean

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<sup>113</sup> Ibid.

<sup>114</sup> Ibid; Margaux J. Hall & David C. Weiss (n 4) p. 315; See also AR4 (n 28).

<sup>115</sup> Ibid.

<sup>116</sup> Nigeria is a party to UNFCCC and its all-important Kyoto Protocol which provides guidelines for cutting emissions of GHGs among states.

the more through daily dredging of the ocean in the name of building Atlantic city and the likes.<sup>117</sup> NESREA has appeared indifferent in addressing this great challenge. Since NESREA has the power to regulate the use of the environment, one would have expected to see a situation where environmental devility as common in cities like Lagos is put under strict national control by NESREA because the imminent future impact will not only affect the culprits but many innocent Nigerians and other citizens of the world.

As of today in Nigeria, there is no adequate preparation for great flood such as those induced by abnormal rainfall, tsunamis and ocean surge which are associated with climate change. Although, National Emergency Management Agency (NEMA)<sup>118</sup> is claiming to have some action plans, the question is to what extent is NEMA prepared from the experience of recent disasters in Nigeria.<sup>119</sup> There is no adequate preparation for the impact of drought, water scarcity, food scarcity etc which are also all associated with climate change. Many Nigerians feed below the poverty line. Worse still, there is no access to potable water. How will such a country manage national disaster like drought or earthquake, God forbid?

Admittedly, Nigeria has established NESREA in place of defunct Federal Environmental Protection Agency (FEPA).<sup>120</sup> The question still remains, how prepared is Nigeria, especially in adaptation strategies despite the emergence of NESREA? With the already proved impact of climate change, NESREA needs robust and definite actions not only toward mitigation but also creating serious awareness that will provoke adequate adaptation strategies in Nigeria.

All things said and done, it will, however, be unfair not to mention in this paper other efforts that Nigeria has attempted as part of the nation's response to climate change although not directly through NESREA. Since 2003 when Nigeria submitted its first national report to the UNFCCC, the country has made some progress in climate change governance. Apart from establishing NESREA, in its

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<sup>117</sup> Lekki Town and its environment in Lagos which is housing most Lagos elites are substantially on dredged or reclaimed land from the Atlantic Ocean.

<sup>118</sup> The National Emergency Management Agency (NEMA) of Nigeria was established via Act 12 as amended by Act 50 of 1999, to manage disasters in Nigeria. For details about NEMA, See NEMA, available at <http://nema.gov.ng/2131-2/> accessed on 04 November 2017; See also UN-SPIDER 'Nigeria National Emergency Management Agency (NEMA)', UN-SPIDER Official Website available at <http://www.un-spider.org/links-and-resources/institutions/national-emergency-management-agency-nema>, accessed on 04 November 2017.

<sup>119</sup> This includes the 2012 floods in Nigeria, on-going Boko Haram terrorism causing internal displacement of people among others.

<sup>120</sup> FEPA was established in Nigeria in 1988 following the celebrated Koko toxic waste incident, and the agency was managing the Nigerian environment until NESREA act repealed its establishment Act in 2007.

current national development plan (Vision 2020), the government of Nigeria has recognized the threat being posed by climate change to its economic prosperity and future development.<sup>121</sup> The Ministry of Environment, in order to improved policy formulation and or coordination on climate change issues, created a Special Climate Change Unit which was later transformed into the Department of Climate Change. The Department signed a co-operation agreement with Germany and nine other West African Countries<sup>122</sup> in 2014 on how to collaborate on climate change policy review and development of climate. The collaboration was meant to take place within the newly created West African Science Service Centre on Climate Change and Adapted Land Use framework.<sup>123</sup>

In addition, in 2008, in order to improve the country's ability to set, coordinate, and implement climate change policies, two competing Bills were introduced into the Nigerian Parliament. While the first Bill proposed the creation of an agency on climate change with close link or ties to the Ministry of Environment, the second Bill was meant to create an independent National Commission on Climate Change.<sup>124</sup> It is however disheartening that the two Bills did not see the light of the day as they were trapped in the legislative process. In 2010, Parliament passed the Bill relating to Commission, but the same was not given assent by the President. In the present parliament, the Bill has been re-introduced and passed by the House of Representatives while is still at the second reading stage at the Senate. If the Bill is passed into law by the Senate, it would formally establish a robust climate change institution or agency to shoulder the full responsibility on the issue; while also building on the work the climate change department in the Ministry of Environment is doing.

The Climate Change law is also being worked out by the House Committee. The law will provide synergy between the various governmental agencies in mainstreaming climate change into their development actions. From all indications, it appears the country, Nigeria is beating about the bush with due respect to the movers of these ideas. One may wonder whether the country really needs another climate change agency when NESREA is already empowered to enforce all international laws on the environment including climate change in Nigeria. Perhaps it is an attempt to increase institutional capacity. No doubt, the reasonable conclusion is that Nigeria lacks definite purpose in tackling climate

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<sup>121</sup> See Grantham Research Institute on Climate Change and the Environment, 'Global Climate Change Study', *Grantham Research Institute on Climate Change and the Environment Official Website* available at <http://www.lse.ac.uk/GranthamInstitute/legislation/countries/nigeria/>, accessed on 04 November 2017.

<sup>122</sup> These countries are Benin, Burkina Faso, Cote d'Ivoire, Ghana, Gambia, Mali, Niger, Senegal, and Togo.

<sup>123</sup> Grantham Research Institute on Climate Change and the Environment (n 121).

<sup>124</sup> *Ibid.*

change menace.

Other efforts so far deployed include publication of National Adaptation Strategy and Plan of Action on Climate Change for Nigeria in 2011 being the result of collaboration between civil society organizations and international donor organizations to develop a comprehensive adaptation strategy on climate change.<sup>125</sup> The key outlines of the Strategy include responses to climate change in agriculture, freshwater and coastal water resources, fisheries, forests, biodiversity, health and sanitation, human settlements and housing, energy, transportation and communications, industry and commerce, disaster, migration and security, livelihoods, vulnerable groups, and education.<sup>126</sup>

However, it is also sad to mention that the policy document did not find official support which justifies the indecisiveness of Nigeria in addressing the threats from climate change to the nation's populace. In its place, in 2012, the Executive Council approved the adoption of a National Climate Change Policy and Response Strategy (NCCP-RS) with the aim of providing a framework for responding to climate change-induced challenges such as increased flooding and rising sea levels. At last in 2013, a National Policy on Climate Change was finally approved and adopted by the Federal Executive Council, which policy is now to form the basis for any new climate change law.<sup>127</sup> Till date, this policy has not received any significant or specific implementation but exist only in principle.

## Conclusion and Recommendation

This paper has discussed climate change and related concepts such as climate variability and global warming. It is found in the paper that climate change which is a change in the statistical distribution of weather over periods of time that range from decades to millions of years, is real and different from mere climate variability. One of the major consequences of climate change is the gradual increase in global temperature which is otherwise known as global warming while the causes range from natural to anthropogenic reasons of which the anthropogenic causes are more.

It has also been established that the reality of climate change is beyond any unnecessary skepticism and climate change is a challenging global phenomenon that is affecting the entire Africa and Nigeria in particular in the continent.

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<sup>125</sup> Ibid.

<sup>126</sup> Ibid.

<sup>127</sup> See New Climate Policy Database, 'National Policy on Climate Change Nigeria 2013', *Climate Policy Database Official Website* available at [http://climatepolicydatabase.org/index.php/National\\_Policy\\_on\\_Climate\\_Change\\_Nigeria\\_2013](http://climatepolicydatabase.org/index.php/National_Policy_on_Climate_Change_Nigeria_2013), accessed on 4 November 2017.

Consequently, climate change is not a fantasy in Nigeria, the largest country in the African region, a country which also has substantial contributions to the problem of climate change, given her unrepentant gas flaring activities in her oil and gas based economy among other factors. The paper has, in addition, examined global strategies viz, mitigation and most importantly adaptation against climate change as promoted in recent times. It is also the argument in the paper that while it is commendable that Nigeria has set up NESREA as an environmental protection and climate change mitigating institution, the country has done little or nothing successfully in the mitigation processes and much more in the all-important adaptation strategy as globally expected because daily offensive environmental misuse persists, thereby leaving the country's teeming population vulnerable to the hazard of climate change and its consequences. In a nutshell, the country has been entangled in a series of indecisive effort that has produced no practical effects in addressing the problems.

Going forward, NESREA, being the extent environmental agency in Nigeria with the mandate to enforce all climate change treaties, convention, agreements, protocols etc locally and institutionally should live up to its statutory calling by embarking on serious and proactive enforcement of the laws. Having seen that climate change problem has transnational impacts, the agency cannot afford to be indifferent as currently done in the areas of enforcement which is the core of its mandates.

It is also recommended that rather than seeking for the establishment of another climate change institution or commission through legislative enactment, NESREA should be strengthened structurally, financially and in terms of human capacity. The agency, with less than 2000 staff currently lacks human capacity to manage climate change problem in particular and environmental challenges generally in a country with over 180 million people stretched across a total land area of 923,768 square kilometers. The Nigerian government should develop and equip the agency financially to enable it to realize its mandate rather beating about the bush.

Nigeria should also give proactive attention to the implementation of the National Policy on Climate Change. This will give effect to the country's series of commitment under various international climate change treaties. Finally, it is recommended that a great synergy should be built and maintained between NESREA and NEMA in the management of the impacts of climate change already being felt across the length and breadth of the country. This will greatly help the country in the rescue of the teeming and vulnerable Nigerians that are being affected almost on daily basis.