CHAPTER FIFTEEN

CLIMATE CHANGE: LEGAL RESPONSE TO AVIATION EMISSION IN NIGERIA.

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ABSTRACT

Aviation is a rogue sector and its environmental impact is out of control. Climate change is the most urgent challenge facing humanity and yet aviation policy is doing the opposite of what is needed.[788]

It is on the basis of the above submission that this paper discusses the impact of aviation on climate change and the Nigerian legal response to greenhouse gas emissions from the aviation sector with a view to knowing the efforts being made by the Nigerian government to reduce the impact of aviation emissions on climate change. The paper finally concludes that Nigeria follow unsuccessful efforts of International Civil Aviation Organization to reduce aviation emissions.

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I. INTRODUCTION

It is no longer news that climate change or global warming has become a new reality in almost all parts of the world. No thanks to its disastrous effects which include sea-level rise with its attendant consequences, fiercer weather, floods, hurricanes, drought and a host of other health and socio-economic consequences.
This paper intends to look at the impact and legal response to aviation emissions on climate change particularly in Nigeria.

Aviation emissions impact greatly on the Nigerian environment because aircraft engines emit noise, particulates, and gases. All these contribute in no small measure to climate change and global warming[789].

However, natural and human influences account for causes of climate change[790]. There are various factors that can shape climate forcings. These include such processes as variation in solar radiation, deviation in the Earth's orbit, mountain - building and continental drift and change in greenhouse gas concentrations.[791] The implication is that the climate system can take centuries or longer to fully respond to new external forcings[792]

In view of the above, climate change can be defined as a change in the statistical properties of the climate system when considered over periods of decades or longer.[793] According to the United Nations Framework Convention on climate change, it is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which in addition to natural climate variability observed over comparable time periods.[794] It is also, in the context of Environmental Policy, referred to as the changes in the modern climate including the average rise in surface temperature known as global warming[795]. In the word of Intergovernmental Panel on Climate Change, Climate change is the change

789 *International Civil Aviation Organization, Air Transport Bureau (ATB) (ND), 'Aircraft Engine Emissions' <http://www.icao int/cao/enu/acc/htm> accessed on 19 March, 2008.*
790 *AviationSmog <http:www.ipcc.ch/pdf/assessement-report/ar4_syr_spm.pdf> ibid.*
791 *See <http://en.wikipedia.org/wiki/climate change> accessed on 16 April, 2010.*
792 *<http://en.wikipedia.org/wiki/climate change>, ibid.*
793 *'Climate Change' http://en.wikipedia.org/wiki/Climate change accessed on 1 April, 2010.*
794 *UNFCCC, Article 2 (2).*
795 *Category: Climate Change' <http://en.wikipedia.org/wiki/Category:Climate_change> accessed on 1 April, 2010.*

in the state of the climate that can be identified by changes in the mean and/or variability of its properties, and that persists for extend periods, typically decades or longer.[796]

In this regard, like all human activities involving combustion, most forms of aviation release carbon dioxide (Co_2) into the earth's atmosphere which contributes immensely to the acceleration of global warming. It is important to add that most aircraft in flight released Co_2 through the burning of fuels such as Jet –A (turbine aircraft) or Avgas (piston aircraft), the aviation industry also contributes greenhouse gas emission from ground airport vehicles and those used by passengers and staff to access airports, as well as through emissions generated by the production of energy used in airport buildings, the manufacture of aircraft and the construction of airport infrastructure.[797]

While the principal greenhouse gas emission from powered aircraft in flight is Co_2, other emissions include nitric oxide and nitrogen dioxide together termed oxides of nitrogen or N0x, water vapour and particulates (soot and sulfate particles), sulfioxides, carbon monoxides (which bonds with oxygen to become Co_2 immediately upon release), in completely burned hydrocarbons, tetra-ethyl lead (piston aircraft only), and radicals such as hydroxyl, depending on the type of aircraft in use[798].

In addition, the contribution of civil aircraft-in-flight to global $C0_2$ emissions has been estimated at around 2%. However, in the case of high-altitude airliners which frequently fly near or in the atmosphere, non-$C0_2$ altitude-sensitive effects may increase the total impact on antrliropogenic (manmade) climate change significantly. This problem is not present for aircraft that routinely operate at lower altitude well inside the troposphere, such as balloons, airships, helicopters, most light aircraft, and many commuter aircraft.[799]

796 *Pachauri P.K. and Reiseinger A. (ed.) 'Climate change: Synthesis Report. Contribution of Working Group I,II and III to the Fourth Assessement Report of the Intergovernmental Panel on Climate Change' (IPCC, Geneva, Switzerland, 2007) p. 104.*

797 *'Aviation and the Environment', http://en.wikipedia.org/wiki/Aviation_and_the_environment accessed on 16 April, 2010.*

798 *'Aviation and the Environment', ibid.*

799 *'Aviation and the Environment', ibid.*

Treaties and conventions create obligations and norms of behaviour for the States which are parties to them.[742] It follows that in principle, treaties are binding only on the signatory State, but where a large number of influential States sign a treaty; their explicit acceptance of certain rules of behavior has a strong law-making effect.[743] Nigeria is a signatory to many of the global instruments on the environment. Unfortunately, it has always been found to be lagging behind other nations when it comes to the implementation. This might be due to the effects of military incursion into politics which analysts have argued to be the basis of corruption which has become endemic in the Nigerian society presently.

As the culture of democracy is growing, it has been observed that there is room for improvement not only in the local efforts to improve the standard of living of the citizens, but also in the legislation and implementation of policies on the environment.

VI. NATIONAL ENVIRONMENTAL STANDARDS AND REGULATIONS ENFORCEMENT AGENCY (NESREA) ACT

Perhaps it was this same culture of democracy that influenced the repeal of the FEPA and introduction of the National Environmental Standard Regulation and Enforcement Agency Act (NESREA), in the year 2007.

On 17 May, 2007 and 30 May, 2007, the Nigerian Senate and the House of Representatives respectively passed the National Environmental Standards and Regulations Enforcement Agency (Establishment) Bill, 2007.[744] On 30 July, 2007, the then Nigerian President, Late Umaru Musa Yaradua, assented to the Bill, thus ushering in a new legal regime in the quest for environmental protection, hereinafter called the NESRE Act, 2007[745]

743 *Thorton and Beckwith, ibid.*
744 *Ogbodo S.G., National Environmental Standards and Regulations Enforcement Agency (NESREA) Act - A Review, http://www.nigerianlawguru.com/articles/environmental law accessed on 8th February, 2011*
745 *The National Environmental Standards and Regulations Enforcement Agency (Establishment) Act, 2007, No. 25. the Act officially commenced on 30 July, 2007.*
746 *FEPA Act cap F 10 LFN, 2004*

By virtue of its Section 36, NESRE Act has expressly repealed the Federal Environmental Protection Agency Act (FEPA Act)[746] which was hitherto recognized as a historic landmark in the legislative enactment on the environment in Nigeria following the Koko episode[747] Consequently, the NESRE Act has become the primary law on environmental protection while the new Agency has replaced the old Agency[748]

It is intended at this juncture to bring into focus some salient provisions of this new Act with a view to establish a link with some of its provisions and the vocal points of this paper. Section 2 of the Act for instance highlights the objectives of the Agency and provides that:

> *The Agency, shall, subject to the provisions of this Act, have responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigerian's natural resources in general and environmental technology, including coordination and liaison with relevant stakeholders within and outside Nigeria on matters of enforcement of environmental standards, regulations, rules, laws, policies and guidelines.*

The provision under this section unequivocally emphasizes not only the question of environmental protection but also the need for a paradigm shift in the enforcement mechanism of the laws relating to the environment. It also goes to establish the need for an effective involvement and coordination among stakeholders in the affairs of the environment. It goes a long way to buttress the argument of this paper that effective implementation and enforcement of the law on environment has been the bane of failure of government policy.

By virtue of its Section 1(1) the Act establishes a corporate entity known as the National Environmental Standards and regulations Enforcement Agency. And, under its Section 2(a), it charges the Agency with the enforcement of environmental standards, regulations, rules, laws, policies and guidelines. As a government agency for the protection of the environment, the Act recognizes it as a corporate entity and

747 *Supra*
748 *Ogbodo, National Environmental Standards and Regulations Enforcement Agency (NESREA) Act - A Review, ibid.*
749 *See Section 2(b)*

endowed it with perpetual succession and a common seal.[749] Thus, the Agency in its responsibilities can sue and be sued in its corporate name.[750]

In order to translate and express its legal status under the law into practical reality, the Agency is armed with a wide range of powers with a view to making its operations more effective. For instance, in the sphere of environmental protection, the Agency is capable of "prohibiting processes and use of equipment or technology that undermine environmental quality.[751] The Agency can also "conduct field follow-up compliance with set standards and take procedures prescribed by law against any violator".[752] It is also empowered to establish mobile courts to expeditiously dispense cases of environmental infringements in coordination with the 'relevant judicial authorities' as well as in consonance with the Nigerian Constitution.[753]

The Agency can conduct public investigations and make proposals to the Minister for the review of existing guidelines, regulations and standards on environment.[754] It can also develop environmental monitoring networks, and compile environmental data from other sectors, except the oil and gas sector.[755] In partnership with the public or private agencies, institutions and organizations, it can promote the expansion of research experiments, surveys and studies.[756]

With the approval of the Minister, the Agency can "establish programs for setting standards and regulations for the prevention, reduction and elimination of pollution and other forms of environmental degradation in the nation's air, land, oceans, seas and other water bodies and for restoration and enhancement of the nation's environment and natural resources."[757] Through publications and other appropriate means, the Agency can collect and make available basic scientific data on environmental standards.[758] For services provided, the Agency is empowered to charge fees.[759]

750 See Section 2(c)
751 See Section 8(d)
752 See Section 8(e)
753 See Section 8(f)
754 See Sections 8(g) & (k)
755 See Section 8(l)
756 See Section 8(m)
757 See Section 8(o)
758 See Section 8(p)
759 See Section 8(q)
760 Section 8 (g) (k), (n), (s)

The provisions of the NESRE Act discussed above show the sincere effort on the part of the government to address the issue of environmental pollution by emphasizing the need for a paradigmatic approach to the enforcement of the relevant laws and regulations. It is however unfortunate to note that the powers of the Agency do not extend to environmental issues arising from the oil and gas sector.[760] In other words, the Agency lacks jurisdiction over environmental matters emanating from the oil and gas sector. The negative implications of this apparent lacuna cannot be enumerated enough in this paper.

As stated in this paper, oil spill and Gas Flaring are two major phenomena emanating from the activities of the oil and gas companies.[761] The pollution and damages the two are causing to the environment are very extensive in estimation.[762] Therefore, for the Act that many environmental activists and stakeholders were hoping will address these two major environmental problems to come again and keep silent over the effects of law on these phenomena is really unfortunate.

Also noteworthy is the fact that although the Agency has a Director General as the Chief Executive Officer,[763] it still remains, like its predecessor (FEPA), a parastatal within the Federal Ministry of Environment, Housing and Urban Development.[764] By this statutory arrangement the Minister in charge of the Ministry enjoys an overriding authority over the Agency and its functions.[765]

Enforcement Powers of NESREA

Section 7 enumerates the functions of the Agency which by the way show the extent of its enforcement powers. The Section states among other things that the Agency is:[766]

761 *Supra.*
762 *Supra.*
763 *Section 11(1) & (2)*
764 *See Sections 3 (1) (e), 5 (1) (b), 5 (3), 8 (i), 8 (k), etc Federal Environmental protection Agency (FEPA) was merged into the Federal Ministry of Environmental by virtue of the Presidential Directive Ref. No SGF 5/5/221 of October 12, 1999; referenced in Fagbohun, O. Reappraising the Nigerian Constitution for Environmental Management, (2002) 1 (1)A.A.U Law. Journal, Vol, I No 1, 44; Ogbodo S.G., National Environmental Standards and Regulations Enforcement Agency (NESREA) Act - A Review, ibid. 111 See Sections 3(1) (e), 3 (2), 5(1) (,5(3), 11(1), 33 and 34b).*
766 *See Section 7 (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) and (m)*
767 *See Sections 8 (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) and (s)*

law in Nigeria through the application of Section 12 of 1999 Constitution. These international enactments will now be discussed in seriatim below.

1. CONVENTION ON INTERNATIONAL CIVIL AVIATION[822]

This Convention establishes International Civil Aviation Organization[823] as a specialised Agency of the United Nations with authority to coordinate and regulate international aviation matters. The Convention was signed on December 7, 1944, came into force on April 4, 1947 and received the requisite ratification on March 5, 1947. This Convention has since been revised eight times.[824]

Application Of The Chicago Convention In Nigeria

The application of the Convention to aviation industry in Nigeria is made possible pursuant to Section 12 of the Constitution of Federal Republic of Nigeria, 1999 and Section 30 of the Civil Aviation Act[825] respectively.

The combined effect of the above provisions is to the effect that while Civil Aviation Act adopts provision of Chicago Convention relating to aircraft engine emissions, Constitutional provision sanctions and validates same.

More importantly, the very much aspect that relates to this paper is the provision of Annex 16 volume II of Chicago Convention.

Annex 16 Volume II of Chicago Convention.

The Chicago Convention is supported by eighteen annexes containing standards and recommended practices (SARPs)[826] amongst which is an aspect dealing with environmental protection.

822 *Hereinafter referred to as the Chicago Convention.*
823 *Hereinafter referred to as the ICAO.*
824 *See Convention on International Civil Aviation <http://en.wikipedia.org/wiki/Convention_on_International_Civil_Aviation> accessed on 12 April, 2010.*
825 *Civil Aviation (Repeal and Re-enactment) Act, No 6, 2006.*
826 *Convention on International Civil Aviation, op. cit.*

Annex 16 is divided into two volumes. While volume I deals with aircraft noise pollution, volume II deals with aircraft engine emissions.

Volume II of Annex 16 came into being as a result of adoption of a Resolution in 1971 which later led to specific action on question of aircraft engine emissions and detailed proposals for ICAO standard for control of certain type of aircraft engine emission. As a result of this, Committee on Aircraft Engine Emissions (CAEE) was established with mandate to develop specific standard for aircraft engine emissions. The standard setup was adopted in 1981[827].

Annex 16 Volume II of Chicago Convention prohibits the international venting of raw fuel to the atmosphere from all turbine engine powered aircraft manufactured after 18th February, 1982; limits the emissions of carbon dioxide, carbon monoxide, hydrocarbon(unburned) and oxide of nitrogen from large turbo-jet and turbofan engines intended for subsonic propulsion and manufactured after 1st January, 1986.[828]

2. UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, 1992.[829]

Historically, efforts to develop international consensus that will address the rampaging greenhouse gases that affect climate not covered by Vienna Convention 1985[830] and Montreal Protocol[831] brought about United Nations Framework Convention on Climate Change. In 1990, at the Second World Conference in Geneva, it becomes clear that there was North-South argument on how the developed and developing countries viewed the issue of climate change.

In the opinion of the North, climate change was viewed as a scientific and environmental issue, while the South emphasized the implications for poverty and development of any future regime. Also, while one group was of the opinion that greenhouse gas emissions should be reduced, the other group vehemently opposed

827 *<http://www.icao.int/eshop/pub/anx_info/an16_info_en.pdf> accessed on 17 April, 2010.*

828 *<http://en.wikipedia.org/wiki/Aviation-and-the-environment> ibid. See also Chiavani J., 'The Role of the EU in Attempting to 'Green' the ICAO', EPIGOV Paper No 35, Ecological Institute for International and Environmental Policy, Berlin, 2008, p. 9.*

829 *Hereinafter referred to as UNFCCC.*

830 *This is a Convention for the protection of the ozone layer, 1985.*

831 *This is a Protocol on substances that depletes the ozone layer, 1987.*

any environmental regime that will reduce their revenue generation through restriction on the use of fossil fuel and charcoal. As a result of this divergence of opinions, argument and counter-argument, the International Negotiation Committee for a Framework Convention on Climate Change was established[832] with mandate to negotiate a framework Convention and any related instruments as might be agreed upon, to be opened for signature at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio, Brasil. As a result of UNCED efforts, United Nations Framework Convention on Climate Change was opened for signature at UNCED from 4th – 14th June, 1992 and subsequently at the United Nations Headquarters in New York until 19th June, 1993[833] with 165 signatories and subsequently entered into force on 21st March, 1994[834] with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate change"[835]

The countries that ratified this convention agreed to develop programmes to slow climate change; to share technology and cooperate to reduce greenhouse gas emissions; and to develop a greenhouse gas inventory listing national sources and sinks.

At the Second Earth Summit in Rio, the general consensus was that the responsibility to reduce greenhouse gas emissions and to fight against climate change falls on the developed countries as they were the major contributors to climate change; hence they were made to provide both technical and financial assistance to the parties to the Convention.[836]

The main objective of this Convention is to stabilize greenhouse gas emissions concentration in the atmosphere at a level that would prevent dangerous

832 *Here-in-after referred to as INC which came into being through Resolution45/212 of 21December, 1990.*

833 *See UNFCCC, Article 20.*

834 *See UNFCCC, Article 23.*

835 *See UNFCCC, Article 2. See also <http:ufccc.int/essential_background/convention/background/items/1353.php> See also 'Building a Post-2012 Global Climate Regime: the EU's Contribution' <http://ec.europa.eu/environment/climat/future_action.htm> accessed on 8 April, 2010. See generally, 'Audiovisual Library of International Law: United Nations Framework Convention on Climate Change', New York, 9 May, 1992, <http://untreaty.un.org/cod/avl/ha/ccc/ccc.html> accessed on 8 April, 2010.*

836 *'The Woods Hole Research - Kyoto Protocol', <http://www.whvc.org/resources/online_publications/warmingearth/kyoto.htm> accessed on 14 April, 2010.*

anthropogenic interference with the climate system[837].

The principle to be adopted in reducing or preventing green house gas emissions to the barest minimum is to act on the basis of equality and in accordance with their common but differentiated responsibilities and respect capabilities[838]; take precautionary and preventive measures to minimize the cause of climate change and mitigate its effect[839]; and to provide appropriate policy that will protect climate system against all human-induced changes in accordance with the condition of each party[840], taking into consideration formula, implementation, publication and regular update from national and regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol; and to promote and cooperate in the development, application and diffusion, including transfer, of technologies, practices and process that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors including the energy, transport, industry, agriculture, forestry and waste management sectors[841].

From the foregoing, the UNFCCC committed parties to prevent or reduced and control greenhouse gas emissions from all its sources. However, the relevant portion of the above provision is where the parties to the Convention are committed to reduce or prevent transport[842]of greenhouse gas emissions. It therefore behoves on the parties to the Convention to design policy to prevent or reduce aircraft greenhouse gaseous emissions.

It is important to note that the UNFCCC has a Protocol annexed to it known as the Kyoto Protocol. It equally aims at fighting global warming.[843] The protocol was adopted in December 1997 and came into force 16 February 2005. The countries that have ratified the protocol particularly, industrialized parties, contained in Annex 1 have committed to cut emissions from carbon dioxide, Co_2. Nitrous oxides,N_2O, Methane CH4, Hydrofluorocarbon (SF_6), through their collective efforts to reduce

837 *UNFCCC, Article 2.*
838 *UNFCCC, Article 3(c)*
839 *UNFCCC, Article 3 (3)*
840 *UNFCCC, Article 3(4)*
841 *UNFCCC, Article 4 (1)(b) and (c). (Italic mine)*
842 *Note that transport includes aviation transport.*
843 *See 'Building a Post 2012 Global Climate Regime: the EU's Contribution', op. cit.*

greenhouse gas emissions by 5.2% below the emission levels of 1990 by 2012[844].

It should be noted that the Protocol directs that parties to it reduce emissions from the aviation industry in collaboration with ICAO[845]

According to the Protocol:

> *The parties included in Annex 1 shall pursue limitation or reduction of emissions of green house gases not controlled by the Montreal Protocol from aviation and Marine bunker fuels, working through the International Civil Aviation Organization and International Maritime Organization, respectively*[846]

From the above provision of the Kyoto Protocol, it is clearly shown that the issue of aircraft engine emissions was referred to International Civil Aviation Organization[847]

b) NATIONAL ENACTMENT.

Historically, Nigerian Civil Aviation Policy was formulated in 1989, following the adoption of the report of the Air Commodore Kola Falope Committee which subsequently brought about the creation of defunct Federal Civil Aviation Authority as the Regulatory body in Aviation businesses in Nigeria[848].

In 1995, as a result of reform in aviation sector in Nigeria, the then Federal Civil Aviation Authority of Nigeria was scrapped and the Safety Regulation Authority in relation to aviation business was transferred to Department of Safety Regulation and Monitoring in the Ministry of Aviation[849].

844' *Global Warning Resources: Carbonify.com. Putting Co_2 Where It Belongs!' <http://www.carbonify.com/articles/kyoto-protocol.htm> accessed on 8 April, 2010.*

845 *Protocol to UNFCCC, Article 2 (2). See also 'Kyoto Protocol', <http://en.wikipedia.org/wiki/kyoto_protocol> accessed on 8 April, 2010.*

846 *Protocol to UNFCCC, Article 2 (2).*

847 *Greenaironlie.com, 'International Aviation Emissions Now Firmly on the Post-Kyoto Climate Talks Agenda' <http://www.greenaironline.com/news.php?viewStory=46> accessed on 17 April, 2010.*

848 *Callistus E. U., Introduction to Civil Aviation Law in Nigeria, 1st ed. (Lagos 2006) p. 51.*

849 *Introduction to Civil Aviation Law in Nigeria, p. 52.*

Nigeria's growing influence in both national and international aviation businesses leads to the adoption of International Conventions and Treaties[850]; Protocols[851] and Agreements[852] which later brought about review of her policy in 1999 on aviation matters. Further review of aviation policy in Nigeria brought about Aviation policy, 2001.[853]

The Chapter Three of the Civil Aviation Policy, 2001 deals with aviation environmental protection. It seeks to secure compliance with the provisions of International Civil Aviation Convention, 1944[854], particularly, Annex 16 Volume II which is an aspect relating to aviation engine emissions[855]which have been earlier dealt with.

1. THE CIVIL AVIATION (REPEAL AND RE-ENACTMENT) ACT NO 6, 2006.

The Act established Nigerian Civil Aviation Authority[856]and provides fresh guidelines for the smooth operation of aviation business in Nigeria[857]. The Act contributes to the protection of environment by adopting relevant provisions of Chicago Convention on aviation's engine emissions.

The Act provides:

> *The Authority may by regulation make such provision as expedient: for carrying out the Convention on International Civil Aviation...concluded at Chicago on the 7th day of December 1944,*

850 *Such as Montreal Convention, 1999; United Nations Framework Convention on Climate Change, 1992; International Civil Aviation Convention, 1944 and its subsequent amendments, amongst others.*

851 *Such as Montreal Protocol on substances that deplete the Ozone Layer as either adjusted and amended in London, 1990, Copenhagen, 1992, Vienna 1995, Montreal 1997 and Beijing1999; Kyoto Protocol, 1997.*

852 *Inter carrier Agreement; Open Skies Agreement amongst others.*

853 *Introduction to Civil Aviation Law in Nigeria, op. cit.*

854 *Here-in referred to as the Chicago Convention, 1994.*

855 *See Chicago Convention, 1944, Annex 16 termed "Environmental Protection" (Volume I and II) dealing with both Aircraft Noise and Aircraft Engine Emissions.*

856 *Here-in-after referred to as NCAA. See Section 2 of the Act. The authority to administer all laws, regulations and agreements relating to aviation business including environmental protection relating to aviation industry. See Section 30 of the Act.*

857 *<http://www.ncaa.gov.ng/index.php?option=com_content$view=article> accessed 16 April, 2010.*

> *any annex to the Convention which relates to international standards and recommended practices and is adopted in accordance with the Convention or of any such annex which is made in accordance with the Convention*[858]

The above provision of the Act is to the effect that an aspect relating to environmental protection in aviation industry under the Chicago Convention is very much relevant in Nigeria in order to protect and reduce aircraft engine emissions of greenhouse gases.

The Act further provides:

> *The Authority in exercising its functions in relation to licensing of aerodromes shall have regard to the need to minimize so far as practicable any adverse effect the presence of such aerodrome(s) may have on the environment*[859]

It is therefore incumbent upon the Authority to consider protection of environment before aerodrome[860] is licensed.

2. FEDERAL AIRPORTS AUTHORITY OF NIGERIA ACT CAP. F5 LAWS OF THE FEDERATION ON NIGERIA 2004.

The Federal Airports Authority Act[861] is divided into six parts. Part one establishes a body to be known as the Federal Airports Authority[862] who shall be a corporate entity with perpetual succession and common seal and may sue and be sued in its corporate name and hold or dispose property, whether movable or immovable.[863]. Part one further establishes Governing Board for the Authority.[864]

858 *Civil Aviation Act, Section 30(1)(a).*
859 *Civil Aviation Act, Section 40.*
860 *Aerodromes is any machine that can derive support in the atmosphere from reactions of the air other than reactions of the air against the earth's surface. See Civil Aviation Act, Section 78(1).*
861 *Here-in referred to as the Act.*
862 *Here-in-after to be called the Authority.*
863 *See Federal Airports Authority of Nigeria Act. Section 1(1) and (2) respectively*
864 *Federal Airports Authority of Nigeria Act. Section 2*

Part Two of the Act provides for the general functions of the Authority[865]; Part Three provides for the staff of the Authority[866]; Part Four for financial provisions[867]; Part Five gives the Authority power to acquire and hold land compulsorily[868].

It merits mentioning that the aspect that relates to this topic under consideration is contained in part two of the Act.

The Act provides:

> *Notwithstanding any other provision of this Act, the Minister may give to the Authority directions to do a particular thing which it has power to do or refrain from doing a particular thing if the Minister considers it appropriate to give such directions:*
> *in order to prevent or deal with noise, vibration, pollution or other disturbance attributable to aircraft used for the purpose of civil aviation and in so far as any directions given in pursuance of this paragraph conflict with the requirements of any enactment or instrument relating to the Authority except in time of war whether actual or imminent, or of great national emergency, those requirements shall be disregarded (emphasis added)*[869]

From the above provision of the Act, it is suggested that the phrase other disturbance attributable to aircraft used for the purpose of civil aviation can be said to mean aircraft greenhouse gaseous emissions including but not limited to carbon dioxide. Therefore, the Aviation Minister is authorized to make standard and recommendation to control aircraft engine emissions that affect climate negatively. From the foregoing, it is our findings that legal response to aviation related pollution causing climate change in Nigeria followed the path of international legislations on the subject matter.

V. CONTROL STRATEGIES.

The importance of protecting our environment from the hazardous effect of emissions from aircraft cannot be over emphasized.

865 *Federal Airports Authority of Nigeria Act. Section 3-8*
866 *Federal Airports Authority of Nigeria Act. Sections 9-11*
867 *Federal Airports Authority of Nigeria Act. Sections 12-16*
868 *Federal Airports Authority of Nigeria Act. Sections 17-20*
869 *Federal Airports Authority of Nigeria Act, Section 8(f)*

In the recent time, UK government policy statements have stressed the need for aviation to address its total climate change impacts and not simply the impact of CO_2. The UK government has even gone far as to exclude emissions from internal aviation from 2050 emissions targets[870]. The government is working ceaselessly in response to climate change as it drags the aviation industry into the 21st century[871].

Modern jet aircraft are significantly more fuel efficient (and thus emit less $C0_2$ in particular) than 30 years ago. Moreover, manufacturers have forecast and are committed to achieving in both Co_2 and No_x emissions with each new generation of design of aircraft and engine[872].

Another possible reduction of the climate change impact is the limitation of cruise attitude of aircraft. This would lead to a significant reduction in high-attitude contrails for a marginal trade-off of increase flight time and an estimated 4% increase in Co_2 emissions. Drawbacks of this solution include very limited airspace capacity to do this, especially in Europe and North America and increased fuel burn because jet aircraft are less efficient at lower cruise attitude.[873]

However, some scientists and companies such as GE Aviation and Virgin Fuels are researching bio fuel Technology for use in jet aircraft. As part of this test, Virgin Atlantic Airways flew a Boeing 747 from London Heathrow Airport to Amsterdam Schipol Airport on 24 February 2008, with one engine burning a combination of coconut oil and Babassu oil[874]. But Green peace's Chief Scientist Doug Parr said that the flight was "high-attitude greenwash" and that producing organic oil to make bio-fuel could lead to deforestation and a large increase in greenhouse emissions.[875]

The majority of the World's aircraft are not large jetliners but smaller piston aircraft, and many are capable of using ethanol as a fuel with major modifications. Though, ethanol also releases Co_2 during combustion, the plants cultivated to make it draw

870 *<http://www.greenpeace.org.uk/climate/aviation> accessed 16 April, 2010.*
871 *<http://www.greenpeace.org.uk/climate/aviation>, ibid.*
872 *<http://en.wikipedia.org./wiki/aviation-and-the environment>, op. cit.*
873 *<http://en.wikipedia.org./wiki/aviation-and-the environment>, ibid.*
874 *<http://en.wikipedia.org./wiki/aviation-and-the environment>, ibid.*
875 *<http://en.wikipedia.org./wiki/aviation-and-the environment>, ibid.*

that same Co_2 out of the atmosphere while they are growing; making the fuel closer to climate-change-neutral.[876]

Another alternative to reduce the environmental impact of aviation is to constrain demand for air travel. This can be done through economic instrument.[877]

A study published by the campaign group Aviation Environment Federation (AEF) concludes that by levying $9 billion of additional taxes, the annual rate of growth in demand in the UK for air travel would be reduced to 2%.[878]

VI. CONCLUSION AND RECOMMENDATION(S)

It is not an exaggeration that Aircraft engine greenhouse emissions are one of the major contributors to climate change in Nigeria, even though Nigeria is not one of the industrialized countries. These emissions upon been released into the atmosphere seriously affect the climate negatively.

As a result of this negative impact on Nigeria climate, the Federal Government through national and international enactments seeks to reduce or limit the aircraft engine emissions. Such national enactment includes Nigeria Civil Aviation Act, and Federal Airports Authority of Nigeria Act, while international enactment includes Chicago Convention, United Nations Framework Convention on Climate Change and Protocol to United Nations Framework Convention on Climate Change which were made applicable in Nigeria through constitutional provision.

At this juncture, it merits mentioning that although Nigeria has taken giant steps in combating aircraft engine emissions through the applications of both national and international enactments, it is however stated that while national enactments places reliance on international enactments, international enactments also places reduction and limitation of Aircraft engine emissions on the collaboration of both the party and the ICAO.

876 *<http://en.wikipedia.org./wiki/aviation- and- the environment> , ibid.*
877 *<http://en.wikipedia.org./wiki/aviation- and- the environment >, ibid.*
878 *<http://en.wikipedia.org./wiki/aviation- and- the environment> , ibid.*

While corroborating the above submission, in a media release, ICAO stated that it has been recognized as the global instrument for developed countries to pursue the limitation or reduction of green house gas emissions from international aviation. ICAO further stated that it has been in charge of environmental issue ever since the 1960s, but encountering difficulties in incorporating aviation emissions of green house gases into emissions agreement was too hard due to problems in allocating them to specific countries.[879]

Addenda to the above finding are the key decisions taken by the ICAO with regard to the aviation and climate change in the following order:

- In 1996, the ICAO Council adopted a resolution to the effect that all the related emission levies on air transport should be in the form of charges rather than taxes.[880]
- In 2001, 33rd ICAO Resolution reaffirmed ICAO Council Resolution in1996[881]. Also, ICAO ruled out possibility of establishing Green Gashouse Emissions standards for aircraft.[882] They further opposed the application of close emission trading schemes for aviation, that is, scheme designed in such a way as to limit or reduce emissions within one sector only, without providing access to allowances or credit from outside that sector. The report of the fifth meeting of ICAO concluded that a closed emissions trading system does not show cost benefit results to justify further consideration. Instead, the 33rd Assembly resolution endorsed the development of an open emissions trading system for international aviation[883].
- In 2004, ICAO ruled out the possibility of establishing a specific global emissions trading scheme for aviation but however recommended the inclusion of aviation emissions in the existing emissions trading schemes,

879 *See 'SourceWatch: Greenhouse Gas Emissions from the International Aviation Industry', <http://wwww.sourcewatch.org/index.php?title=Greenhouse_gas_emissionsfrom_the_i> accessed on 18 April, 2010.*

880 *'ICAO: Council Resolution on Environmental Charges and Taxes', adopted by the Council on 9 December, 1996 at the 16th Meeting of its 149th Session, <http:www.icao.int/icao/env/taxes.htm> accessed on 28 April, 2010.*

881 *'ICAO: Council Resolution A33/7, 'Consolidated Statement Of Continuing ICAO Policies And Practices Related To Environmental Protection', <http//www.icao.int/icao/en/env/a33-7.htm> accessed on 28 April, 2010.*

882 *CAEP: The Fifth Meeting of the Committee on Aviation Environmental Protection (CAEP/5) held in Montreal from 8-17 January, 2001.*

883 *CAEP: Market Based Measure-Report from Working Group5 to the fifth meeting of the Committee on Aviation Environmental Protection, CAEP/5-IP/22, 5/01/2001. See also 'The Role of EU in Attempting to Green the ICAO', op. cit.*

endorsed voluntary trading schemes that interested Contracting states and international organizations might propose and to provide guidance for use by Contracting States to incorporate emissions from international aviation into Contracting States' emissions trading schemes consistent with the UNFCCC process.[884]

In 2007, during the ICAO 36th session, the Assembly made the following conclusions:

i. continuing to play its leadership roles in civil aviation matters, environment and Greenhouse gas emissions;
ii. continuing to study available policy options to limit or reduce the environmental impact of aircraft engine emissions; and
iii. continuing to cooperate with other policy-making organizations including UNFCCC.[885]

However, according to Yvo de Boer[886] while addressing the delegates in Bangkok Climate Change on 10th April, 2008:

> *I think everybody agrees that we have to find some way of addressing emissions from aviation and shipping*[887]

From the comment of Yvo de Boer above, it is clearly shown that the world is coming out with something reasonable globally to tackle the difficulties in incorporating aircraft engine emissions into global enactment as emissions from aviation represents one of the fastest growing source of greenhouse gas emissions[888]

Despite the statement of Yvo de Boer, the world aviation sector under the leadership of ICAO has been in difficulty of agreeing on a particular Convention or Protocol to limit or reduce aircraft engine emissions. The testimony to this statement can be

884 *'ICAO: Council Resolution A35/5, Consolidated Statement Of Continuing ICAO Policies And Practices Related To Environmental Protection', <http://www.icaoint/env/a35-5.pdf> accessed on 29 April, 2010.*

885 *ICAO: Resolutions Adopted by the Assembly at its 36th Session, A36-22: Consolidated statement of continuing ICAO policies and practices related to environmental protection, 09/2007, <http://www.asil.org.>*

886 *Yvo de Boer is the United Nations Framework Convention on Climate Change Executive Secretary.*

887 *Yvo de Boer, on international aviation emissions now being firmly on the Post-Kyoto Climate talks agenda. Accessed at <http://www.greenairline.com>*

888 *See 'The Position Paper of the European Union on the Status Of Aircraft And Shipping Emissions'. See also de Boer, op. cit.*

found from the report of working paper on High-Level Meeting on International Aviation and Climate Change where Nigeria presented a paper on behalf of other African states to the effect that they opposed unilateral measure by state or regional sector but by collective efforts of all the states. They further reaffirm their support for ICAO leadership and roles in overcoming the challenge of aviation emissions through the UNFCCC's principle of Common but Differentiated Responsibilities on all ICAO's ongoing efforts to reduce or limit all aviation emissions.[889]

After the High-level meeting, the world still has the opportunity of meeting again at Copenhagen summit on 22nd December,2009 wherein some aviation related issues such as engine emissions were discussed but no concrete agreement was made on how to reduce aviation emissions, hence, the whole aviation sector with regard to aviation emissions remain standstill.[890]

In Nigeria, the challenge of aviation sector in relation to aircraft emissions reduction or limitations still persist as the Nigeria Civil Aviation Authority relied on ICAO's principles, rules and regulations governing environmental protection on aviation sector.

At this juncture it needs be said that even Section 40 of Civil Aviation Act, No 6, 2006 only provides that the NCAA shall take cognizance of environment while licensing aerodrome. It therefore merits mentioning that the aerodrome mentioned is not aircraft. Also part 16 of the Civil Aviation Regulation, 2006 only provides for Noise pollution

From the foregoing discussions it is clearly shown that the issue of aviation related greenhouse gaseous emissions has not been adequately taken care of as same was left for the ICAO to implement. Also, there is no clear enactment relating to aviation related pollution in Nigeria.

889 *'Working paper on High-Level Meeting on International Aviation and Climate Change' held at Montreal, between 7-9 October, 2009. This paper was presented by Nigeria on behalf of African states on proposal for strategies and measures to reduce or limit aircraft emissions.*

890 *'Transport and Environment Copenhagen Analysis: What are we Left With on Aviation After Copenhagen? <http://www.greenaironline.com/news.php?viewStory=713> accessed on 27 April, 2010; 'Transport and Environment Copenhagen: Analysis: Aviation and Shipping Emissions after Copenhagen', <http://www.transportenvironment.org/ News?2010/1/ Analysis-Aviation-and-Shipping-Emission-after-Copenhagen/> accessed on 27 April, 2010.*

Furthermore, as we have stated earlier, from the international scene, the major problem militating against reduction or limiting aviation greenhouse emissions is that of how to allocate percentage of greenhouse gas emissions to a particular state. Thus in order to make progress on aviation emissions reduction, the following are hereby recommended:

- Nigeria should specifically provide for a particular regulation on Aircraft Emission Reduction
- The World should work through ICAO and UNFCCC to adopt global sector approach for aviation that does not distort competition amongst airline.
- Nigeria government should work with other members of ICAO to take a global approach to emission reduction.
- Nigeria should allow full access to all available abatement measures outside the aviation sector.

Nigeria should join the rest of the world to address the issue of emissions with a view to reach international consensus on measure to reduce aviation emissions.