**Use of Biofuels in Aviation: An Environmental Issue**

**A National and International Perspective**

**Abstract:**

Global warming and climate change refer to an increase in average global temperatures. Natural events and human activities are believed to be contributing to an increase in average global temperatures. This is caused primarily by increases in “greenhouse” gases such as Carbon Dioxide (CO2). The burning of coal, oil, and natural gas, as well as deforestation and various agricultural and industrial practices, are altering the composition of the atmosphere and contributing to climate change. These human activities have led to increased atmospheric concentrations of a number of greenhouse gases, including carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and ozone in the lower part of the atmosphere. Carbon dioxide is produced when coal, oil, and natural gas (fossil fuels) are burned to produce energy used for transportation, manufacturing, heating, cooling, electricity generation, and other applications. The use of fossil fuel currently accounts for 80 to 85% of the carbon dioxide being added to the atmosphere. This increasing dependency of mankind on energy resources primarily fossil fuels—coal and oil—has contributed to the phenonmenon of global warming and climate change. This has led to the increase in atmospheric temperature leading to more destructive floods, serious and sustained droughts, and relentless snowfalls and severe changes in weather pattern. Thus it is an established fact that the human lives are closely linked to weather and climate, and to energy use.

One way to slow these trends is to increase energy efficiency and develop and use clean, sustainable energy sources. Political and business leaders throughout the world recognize that global climate change is real, and are taking steps to reduce fossil fuel emissions. Many energy-intensive industries are responding to the climate change challenge. Some oil companies are using their best expertise and talent to find better ways to extract, ship, and refine coal, natural gas, and petroleum to minimize their effects on the environment. Additionally, some are finding ways to use their own waste products to produce energy and other useful coproducts; others are looking at possibilities associated with alternative energy sources. Over the last decade, biofuels have emerged as the new alternative to the conventional energey sources. They are considered to be a new source of income for rural communities and as a solution to tackle the problem of energy crisis and climate change and global warming. In the recent times attractive proposals of using biofuels in aviation industry have been put forward.

Aviation industry is emerging as a fast developing industry due to the increase in globalisation around the world. For example in India before 1991 only one air travel industry was there but at present around 5 air travel industries are there. Like all human activities involving [combustion](http://en.wikipedia.org/wiki/Combustion), most forms of [aviation](http://en.wikipedia.org/wiki/Aviation) release [carbon dioxide](http://en.wikipedia.org/wiki/Carbon_dioxide) (CO2) into the Earth's [atmosphere](http://en.wikipedia.org/wiki/Atmosphere), contributing to the acceleration of [global warming](http://en.wikipedia.org/wiki/Global_warming). Aviation industry contributes to green house gas emissions not only through the CO2released by burning of fuels such as [Jet-A](http://en.wikipedia.org/wiki/Jet_fuel) (turbine aircraft) or [Avgas](http://en.wikipedia.org/wiki/Avgas) (piston aircraft) by most aircrafts in flight but also contributes [greenhouse gas](http://en.wikipedia.org/wiki/Greenhouse_gas) emissions from ground [airport](http://en.wikipedia.org/wiki/Airport) vehicles which are used by passengers and staff to access airports. In addition aviation industry also causes CO2emissions generated by the production of energy used in airport buildings, the manufacture of [aircraft](http://en.wikipedia.org/wiki/Aircraft) and the construction of airport infrastructure.

While the principal [greenhouse gas](http://en.wikipedia.org/wiki/Greenhouse_gas) emission from powered aircraft in flight is CO2, other emissions may include [nitric oxide](http://en.wikipedia.org/wiki/Nitric_oxide) and [nitrogen dioxide](http://en.wikipedia.org/wiki/Nitrogen_dioxide), (together termed [oxides of nitrogen](http://en.wikipedia.org/wiki/Oxides_of_nitrogen) or NOx), [water vapour](http://en.wikipedia.org/wiki/Water_vapour) and [particulates](http://en.wikipedia.org/wiki/Particulates) (soot and sulfate particles), sulfur oxides, [carbon monoxide](http://en.wikipedia.org/wiki/Carbon_monoxide) (which bonds with [oxygen](http://en.wikipedia.org/wiki/Oxygen) to become CO2immediately upon release), incompletely burned [hydrocarbons](http://en.wikipedia.org/wiki/Hydrocarbons), [tetra-ethyl lead](http://en.wikipedia.org/wiki/Tetra-ethyl_lead) (piston aircraft only), and radicals such as [hydroxyl](http://en.wikipedia.org/wiki/Hydroxyl), depending on the type of aircraft in use. The contribution of civil aircraft-in-flight to global CO2, emissions has been estimated at around 2% of the total anthropogenic CO2,emissions. However, in the case of high-altitude [airliners](http://en.wikipedia.org/wiki/Airliners) which frequently fly near or in the [stratosphere](http://en.wikipedia.org/wiki/Stratosphere), non- CO2, altitude-sensitive effects may increase the total impact on anthropogenic (man-made) [climate change](http://en.wikipedia.org/wiki/Climate_change) significantly

States all over the world as well as individual air lines are conducting research in order to find out alternative fuels so as to reduce the impacts of aviation industry on climate and environment. They have adopted number of approaches to reduce the green house gas emissions and their impacts on climate. One of the significant approach is by the reduction of air travel’s consumption of [fossil fuels](http://en.wikipedia.org/wiki/Fossil_fuel) because air travel’s contribution to [well-mixed greenhouse gases](http://en.wikipedia.org/wiki/IPCC_list_of_greenhouse_gases) is completely dominated by the emission of [carbon dioxide](http://en.wikipedia.org/wiki/Carbon_dioxide) from burning fossil-derived [aviation fuels](http://en.wikipedia.org/wiki/Aviation_fuel). This approach includes two components: Improve [fuel efficiency](http://en.wikipedia.org/wiki/Fuel_efficiency_in_transportation) and Use a [biofuel](http://en.wikipedia.org/wiki/Biofuel). Some airlines have already demonstrated flights using biofuels for example the [Virgin Atlantic](http://en.wikipedia.org/wiki/Virgin_Atlantic_Airways) in February 2008, [Air New Zealand](http://en.wikipedia.org/wiki/Air_New_Zealand) in December 2008 and [Continental](http://en.wikipedia.org/wiki/Continental_Airlines) and Japan Airlines in January 2009. In November 2009, [KLM](http://corporate.klm.com/en/home) became the first airline to perform a passenger-carrying flight using biofuel.

The use of biofuels might address greenhouse gas emissions, but it also raises [other issues](http://en.wikipedia.org/wiki/Issues_relating_to_biofuels) such as the impact on land ecosystem, effect on agriculture and food security and the use of chemicals in augmenting production of crops for bio fuels. It has to be kept in mind that the protection and conservation of land ecosystem and maintenance of agriculture and food security are very vital for the protection of the basic human rights of the people and environment. The various international intsruments like Stockholm Declaration 1972, Rio Declaration 1992 and the Declaration on Right to Environment 1986 address the issue of protection of environment which is a basic human right.The United Nations Framework Convention on Climate Change (UNFCCC) specifically addresses the issue of global warming and climate change and the need to reduce the green house gas emissions by anthropogenic activities. They also recognise the need for improving energy resources and especially developing green fuels in order to combat global warming and climate change. Hence in the quest for searching new alternatives for energy resources and developing eco- friendly bio fuels, mankind should not aggravate the problem of land degradation, destruction of ecosystems, disruption of agriculture and scarcity of food crops. Thus there is a need to examine the production of biofuels from an environmental and human rights perspectives. This paper highlights the need to develop alternative fuels or environmental friendly biofuels for use in aviation industry in order to reduce the emissions of carbondioxide and problem of global warming and climate change. It also examines the impact of biofuels from an human rights and environmental perspective. Thus this paper focuses on the international and national legal framework dealing with the climate change and global warming and discusses the issue of biofuels in aviation industry as a measure for combating climate change. It also examines the need to regulate biofuels for protection of environment and human rights.

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