**Air Transport System-Emerging Environmental Issues**

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**INTRODUCTION**

Mobility is an integral component of modern life. An efficient and convenient transportation system plays a key role in economic growth, and the preservation of a high quality of life. Transport has always played an important role in the economic development of almost all countries at all given time. However the transportation system can have a disruptive impact on land, water, and air resources which implies that transportation like any other human activity affects environment.[[1]](#footnote-1) Air transport which has become a world industry is also a component of transport system having no geographical boundaries.[[2]](#footnote-2) Air transport affects most in terms of air pollution both local and global, local noise and vibration, waste, land use, congestion, and traffic accidents. Harmful chemicals sift down from the smoky trails of low-flying jets. The scream of jet engines is constantly heard by people who live near big-city airports. Jet aircraft, particularly the supersonic transport (SST) could engender stratospheric air pollution with consequent changes in climate.[[3]](#footnote-3) So such developments have given rise to the question of proper balancing between the positive effects (benefits) and unavoidable negative impacts (cost of damage) of transport operations over the short, medium and long term. And hence the concept of sustainable transport has emerged as the potential solution and as a major policy framework.[[4]](#footnote-4) It was expected that such policies would be accepted by most of the nations.

This paper would analyze and discuss the intricate relationship between environment and the air transport system. The paper would go systematically first giving a brief historical background of the air transport system as it is prevalent and flourishing today. The subsequent part would include the different environment harm which can be caused by the airplanes. Then it moves to discussion of the principles of environment law which are internationally applicable in such cases of environmental damage caused due to the air transport. This paper would be an attempt at elaborating the concept of sustainable air transport system. The next part would be discussing different legislations passed by various countries to put a check on the environmental degradation being caused by airplanes.

**Historical overview:**

The airplane’s military uses in World War I provided considered impetus to the growing interest in aviation because early airplanes were an effective supplement to the military ground forces. They were used successfully for observation and with limited success for bombing of railroads, cities and other targets. At this time people especially investors did not see an expanded civil use of an airplane was to carry the mail. European countries led the way in carriage of mail both on the continent and internationally. World War II made several innovative changes in airline history.

Also, wealthy developed countries log a large number of flying hours on the huge numbers of their military aircraft for spying on other countries and for keeping the flying skills of their bomber pilots sharp.

Since the 1980s environmental protection has been an increasingly important element of work of the Organization. Starting with efforts to limit and reduce aircraft noise in particular in the vicinity of airports the activities have gradually included ‘greenhouse’ gases, carbon-monoxide and nitrogen oxides.[[5]](#footnote-5)

**Components of Air Pollution:**

The air transport system consists of several major components-subsystems- such as the users-passengers and air cargo shipments, airlines, airports, air traffic control (management), aerospace manufacturers and national and international regulatory authorities. As it is the fastest growing sectors such development would create both positive and negative effects on society and the environment. Where the positive effects can be counted as generation of employment at a large scale and general welfare the negative impacts include the damages done to environment and people’s health caused by depletion of the non-renewable fuel resources, air pollution from burning fuels at both local airport and global airspace level, aircraft noise around airports, land take for building up the fixed infrastructure, contamination of soil and drinking water, air traffic incidents and accidents and waste.[[6]](#footnote-6) The positive and negative effects interrelate with each other and are permanently in dynamic interaction. Recognizing such dependability raises the question of operationalisation of the strategies for driving development of air transport system in short and long terms. Similarly as with entire transport system the concept of sustainable development has emerged as an optional strategy.

Airports and aircraft cause many types of air pollution at many different elevations and at considerable distances. Of foremost concern to those living and working even as far as many miles from an airport or under aircraft flight tracks are these: hazardous and toxic air emissions. Aircraft fly over head emitting these toxic compounds in massive amounts and these emissions are spread generally over an area 12 miles long, 12 miles wide on take-off, 12 - 6 miles on landing, (per runway and/or flight track).[[7]](#footnote-7)Newer aircraft, even though emissions go relatively unseen, could be at least as bad at polluting as older aircraft for many reasons including production of smaller particulate matter, with different combustion processes, different formulations in fuel, etc.

Thus the number of people exposed to aviation pollutants and who are affected in an airport’s vicinity can be immense. In Chicago, for instance, a medical doctor who teaches clinical medicine at the University of Illinois-Chicago, School of Public Medicine, estimated that as many as 5-million people's health could be affected as a result of just one airport, O’Hare.

Emission from jet aircraft, particularly on landing and take-offs, are a source of bitter complaints from nearby residents. In a few airports visibility has been dangerously restricted by particulate emissions and photochemical smog. Airlines have a considerable expense in cleaning the obnoxious odors of unburned fuel from aircraft air conditioning systems. Most pilots prefer exhaust plumes, because aircrafts are made more visible.[[8]](#footnote-8)

**International Laws regarding Aircraft Noise Management:**

The continuing policy statement in Resolution A35-5 states three broad objectives for ICAO’s work on environmental protection[[9]](#footnote-9):

* To limit or reduce the number of people affected by aircraft noise; and
* To limit or reduce the impact of aviation emissions on local air quality.

A number of SARPS procedures and guidance material have been developed in order to achieve the objectives namely those in Annex 16, Vol I[[10]](#footnote-10).

**Balanced Approach to Aircraft Noise Management:**-This important element of ICAO’s policy was achieved in 2001[[11]](#footnote-11) as a result of lengthy negotiations. Its main elements are set out in A33-7 supplemented by Guidance on the Balanced Approach to Aircraft Noise Management.[[12]](#footnote-12) The balanced approach consists essentially of a transparent process when considering measures to alleviate aircraft noise, in particular at airports, including[[13]](#footnote-13)

* assessment of noise problems based on objective, measurable criteria;
* evaluation of the likely costs and benefits of measures available and selection of measures so as to achieve maximum environmental benefit most cost-efficiently
* dissemination of evaluation results for consultations with stakeholders and dispute resolution

**Based on these assessments the states are encouraged to**[[14]](#footnote-14)

* Apply land use planning and management policies to limit encroachment of new developments into noise sensitive areas
* Apply noise abatement operational procedures; and
* Apply operating restrictions only as last resort and consistent with Appendix E of A35-5.

**Phase-out of Subsonic Jet Aircraft which exceed the Noise Levels in Volume I of Annex 16**

These principles supplement the provisions of Annex 16 Vol I which do not specify any time limits or phase out for aircraft. They stipulate the following:

* The phase-out of chapter 2 aircraft (i.e. those noisy aircraft which exceed the noise levels of Chapter 3) should only be envisaged as a measure of last resort after normal attribution, non-addition rules and airport usage restrictions have been considered and other States concerned have been consulted[[15]](#footnote-15)
* Any phase-out of Chapter 2 aircraft should give existing operators a time frame of at least seven years for gradual replacement or withdrawal and during these seven years should not apply to aircraft which are less than 25 years old and should not apply to wide body jets during such seven years.[[16]](#footnote-16)

**Local Noise-Related**

As it has already been stated above that operating restrictions for aircraft at noise sensitive airports should be applied only as the last resort under the balanced approach. However if they are applied the following conditions shall be applied[[17]](#footnote-17)

* Before operating restrictions are imposed on Chapter 3 aircraft the phase-out of all Chapter 2 aircraft at the airports concerned should first be completed
* Other available measures under the balanced approach should first be fully assessed;
* Restrictions on Chapter 3 aircraft should be purely performance based
* Restrictions should be tailored to the airport noise problem;
* Restrictions should be partial whenever possible
* The impact of such restrictions on air transport services (e.g. night curfews for long haul services) should be taken into account
* Chapter 4 aircraft should not be made subject to noise related operating restrictions.

**Land use Planning and Management**

Land-use planning and management is one of the four principal elements of the balanced approach under Resolution A35-5, Appendix F, it should be used in combination with the other elements of the balanced approach so as to:[[18]](#footnote-18)

* Avoid inappropriate land-use or encroachment by new developments in the noise sensitive vicinity of an airport
* Locate new airports away from noise sensitive areas
* Define zones around airports associated with different noise levels and
* Enact legislations or establish guidance to achieve compliance.

**Environmental impact of Civil Aviation on the Atmosphere:**

A special report was prepared on ‘Aviation and the Global Atmosphere’ by the Intergovernmental Panel on Climate Change (IPCC) in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone layer and was published in 1999. [[19]](#footnote-19)

According to the report aircraft are estimated to contribute about 3.5% of the total radiative forcing (a measure of change in climate) by all humans activities and this is projected to grow. The work Convention on Climate Change (UNFCCC) sought the assistance from ICAO for reporting greenhouse gas emissions at a national level.[[20]](#footnote-20) The Kyoto Protocol adopted by the Conference of Parties to the UNFCCC in 1997 and which entered into force in 2005, calls for limitation or reduction of greenhouse gases inter alia from aviation fuel emissions as regards the latter the Contracting Parties decided to work through ICAO. The ICAO is working on options to limit or reduce the environmental impact of engine emissions through operational and market based measures and intends to develop concrete proposals and among the tools being explored are inter alia ATM improvements and the use of operational measures as outlined in ICAO Circular 303[[21]](#footnote-21).

While there are no Articles in the Chicago Convention dealing expressly with environment pollution, it is suggested that in Part 111/31 that Article 6, 9 and 11 are bases for imposition by States of environmental restrictions. It has also been argued that customary international law permits such restrictions.

At the 28th (extraordinary) session of ICAO Assembly in October 1990 it was decided that a withdrawal of Chapter 2 Aircraft would take place between 1995 and 2002. It was also decided that there should be no restriction before 1 April 1995 on aircraft less than 25 years old after the date of each first individual certificate of airworthiness on any presently existing wide-bodied aircraft or any aircraft fitted with high by-pass ratio engines.[[22]](#footnote-22)

**Market based Measures Regarding Engine Emissions:**

Market based measures to reduce greenhouse gas emissions are one of the option forseen in the Kyoto Protocol of 1997. Their application to domestically produced emissions in other sector is in an initial stage. Market based measure of three types:

* Voluntary measures
* Emission-relating levies; and
* Emissions-trading

While voluntary measures have been encouraged in the framework of ICAO’s work emission-related levies have not found consensus so further studies are going on regarding introduction of an emission-trading system pursuing two possible approaches.[[23]](#footnote-23) Under the first approach ICAO would support a voluntary trading system which the interested States and international organizations would propose. Under the second approach ICAO would provide guidelines to include emissions from the international aviation into contracting States’ emissions trading systems consistent with UNFCCC process.[[24]](#footnote-24)

**Different jurisdiction:**

**European Countries:**

The EC has developed an extensive body of secondary legislation limiting permissible sound levels of various products and activities.[[25]](#footnote-25) Specific legislation has been adopted establishing limits from motor vehicles, construction plant and equipments, subsonic aircrafts[[26]](#footnote-26), etc. For some years the European Commission introduced legislation designed to reduce the number of noisy aircraft operating at Community airports. The first steps were taken in late 1979 with introduction of Directive 80/51/EEC[[27]](#footnote-27) of 20 December 1979 on limitation of noise emissions from subsonic aircraft that prohibited the addition of non-noise certified aircraft registers of Member States and the removal of such aircraft from registers by the end of 1986. This was followed by Directive 83/206[[28]](#footnote-28) of 21 April 1983 that prohibited non-noise certified aircraft from operating within the Community regardless of their registration.

The next major step was in 1989 with the introduction of Directive 89/629[[29]](#footnote-29) of 4 December 1989 on the limitation of noise emissions from civil subsonic jet aeroplanes that effectively prohibited the addition to the aircraft registers of the Member States of civil subsonic jet aircraft that were not certified to at least the standards of Chapter 3[[30]](#footnote-30) of Annex 16 to the Chicago Convention. The restriction on noisy aircraft were further tightened by Directive 92/14[[31]](#footnote-31) of 2 March 1992 on the limitation of the operation of aeroplanes covered by Part II, Chapter 2, Volume 1 of Annex 16 to the Chicago Convention that limited the operation of Chapter 2 aircraft within the Community regardless of the state of registration.

The next step by EC was the introduction of the controversial Regulation 925/99 relating to the registration and operation within the Community of certain types of civil subsonic jet aircraft that had been modified and re-certified as meeting Chapter 3 standards. Effectively the Regulation prevented the registration within the Community of aircraft that had been ‘hush-kitted’ to meet Chapter 3 standards and prevented the operation of such aircraft at Community airports with effect from April 2002. In essence therefore hush-kitted aircraft were to be dealt with in the same manner as Chapter 2 aircraft. This last Regulation was strenuously contested by the Americans as well as by local and international operators. The US Government took the issue to ICAO and requested ICAO to arbitrate on the grounds that the EC Regulation went beyond the scope of the internationally accepted restrictions embodied within the Chicago Convention. The above mentioned Regulation was also challenged by Omega Air and others on a reference for a preliminary ruling by the High Court of Justice of England and Wales and the High Court in Dublin to the European Court. That challenge resulted in the delivery of an Opinion by the Advocate General Alber to the European Court to the effect of regulation 925/99 was indeed invalid. At the General Assembly a Resolution was passed (A33-7) and incorporated into a consolidated Statement of continuing ICAO policies relating to environmental protection. This approach is more balanced as it is intended to recognize that solutions to noise problems need to be tailored to specific characteristics of airports concerned. In the light of the adoption of the ICAO resolution the EC has now brought forward new legislation.

Unlike 1999 when the EC proceeded by way of a Regulation on this occasion the EC proceeded by way of a Directive of European Parliament and of Council of Ministers which means the implementation is left to the prerogative of the states to determine its own policies.

The Directive 2002/30/EC of Parliament and the Council of 26 March 2002 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports[[32]](#footnote-32) repealed Regulation 925/99 and introduced a new regime under which restrictions and marginally compliant aircraft would be adopted by member states on airport to airport basis. This means that hush-kitted aircraft that meets standards set in Chpater-3 will be no longer subject to a blanket ban but will be subject to limitation or restrictions at Community airports at which noise is particularly sensitive issue and severe problem. The Directive 2002/49 of 25 June 2002 on the assessment and management of the introduction of charges that discourage the operators of noisier aircraft from using certain airports. The Directive was introduced under Article 80 (2) of the Treaty as it aims at introducing a harmonized basis to be applied at airports in the Community in pursuit of single market objectives. The objective of the Directive is to lay down rules to facilitate the introduction of operating restrictions in a consistent manner at the airport level so as to help prevent a worsening of the noise climate and to reduce the number of people affected by the harmful effects of aircraft noise. To that end the Directive seeks to ensure that similar solutions are applied to similar problems at Community airports and that sustainable development of airport capacity is facilitated.

The Directive requires member states to designate an independent authority responsible for implementing the Directive. Member States are required to ensure that competent authorities adopt a balanced approach by considering the available measures to address the noise problem at an airport including reduction of noise at source, land-use planning and management, operational procedures and other noise management methods such as economic incentives and operational restrictions. The authorities are required to take into account the likely costs and benefits of any proposed measures and to ensure that such measures are not more restrictive than is necessary in order to achieve environmental objectives established for the airport. Any decision must be based upon the information specified in Annex 2 to the Directive. [[33]](#footnote-33)

It is important to note that the definition of ‘airport’ excludes airports with less than 50,000 movements per annum (excluding flights for training purposes on light aircraft). Presumably therefore such airports will not be affected by the requirement to introduce operating restrictions and may continue to be used by marginally complaint aircraft. It is relevant to note that there are special rules to cover ‘city airports’ which are listed in Annex 1. Note should be taken that the definition of ‘civil subsonic jet aeroplanes’ which means aircraft with a maximum certificated take-off mass of 34,000 kg or more or with more than 19 passenger seats. Article 5 contains some general rules on assessment based on the information provided in Annex 2 to be adopted in response to a request from the managing body of an airport that requires operating restrictions to be imposed. The Directive requires that an environmental impact assessment be undertaken in accordance with Directive 85/337/EEC (as amended by Directive 97/11/EC). Article 6 contains some specific rules relating to the introduction of operating restrictions aimed at the withdrawal of marginally compliant aircraft. Non-compliant aircraft in developing nations are exempted from the provisions of Article 6 provided they meet the standards set under Chapter 3 and were operated in Community between January 1 1996 and December 2001 and they continue to be operated by a natural or legal person established in that developing nation. The final step taken in this area was the introduction of Parliament and Council Directive 2002/49/EC of 25 June 2002 relating to the assessment and management of environmental noise.[[34]](#footnote-34)

Noise is regulated in the EU by Council Directive 89/629/EEC supplemented by Directives 92/14/EEC which limit the operation of aircraft which do not meet the SARPS of chapter 3 of Annex 16 part I. the SARPS of Chapter 3 impose higher standard than those in Chapter 2. The Directive is applied in the UK by the Air Navigation (Noise Certification) Order 1990 see also sections 77 and 78 of the UK Civil Aviation Act 1982 and the Aeroplane Noise (Limitation of Operation of Aeroplanes) Regulations 1993.

**US Laws:** In USA noise is regulated by the Airport Noise and Capacity Act 1990 and regulations. Annex 16, chapters 2 and 3 requirements are referred to as FAA Stage II and III requirements.[[35]](#footnote-35)

The Belgian Court of Appeal’s decision State of Belgium, *Regie der Luchtwegen (“RDL”)*, *Sabena and Others* v *Robert Brussels and others*[[36]](#footnote-36) is important:

1. The court at first instance had ordered the State and RDL to stop allowing certain aircraft types to overfly specified cities between 11 pm and 6 am near Brussels National Airport. The court ordered a fine to be paid for each violation.
2. The Court of Appeal held:
3. Article 25 of the Belgian Constitution giving a constitutional right to a healthy environment was not directly applicable and not sufficient to obtain a night flight prohibition in the subject case.
4. Article 8-1 of the European Convention on Human Rights does not give an absolute right to privacy.
5. There was no violation of:
6. Law on aerial navigation 27 June 1937 and
7. EC Directives EEC 89/629 and 92/14.
8. The appellants had instituted special night departure routes to avoid over flight of urban areas.
9. The State and RDL are not liable for violation of noise abatement procedures by pilots after clearances for take-off.
10. The decision of the State and the RDL to build an airport near to Brussels urban area is political and dictated by historic and opportunistic reasons. The court is not allowed to have a personal opinion on a decision of authorities on public interest.
11. The claim based on the alleged abuse of right (also based on Aquilian Law (Roman civil law of delict) was not proven.
12. Even if the claim based on “no fault” theory of nuisance (Belgian Civil Code Article 544) had been accepted this would not have authorized the judge to prohibit the activity causing the harm.
13. The claimants had chosen to live adjacent to an airport whose development was forseeable.
14. The claimants could not prove a real loss of value to their properties.

7) An illustration of the application of noise limitation procedures is found in the UK case of *R* v *Secretary of State for Transport ex parte Richmond-upon-Thames London Borough Council[[37]](#footnote-37)* and in the application by IATA on behalf of its member airlines in 1996/1997 which are summarized as follows:

a) In 1993 and 1995 the Secretary of State for Transport issued consultative documents revising the policy under which restrictions were imposed on night flying at London Heathrow, London Gatwick and Stansted Airport under section 78 of the Civil Aviation Act 1982. In August 1995 the Secretary of State made a decision regarding night flying restrictions.

b) subsequently after a series of cases had been filed challenging the decision on flying restrictions by way of an application for judicial review on the grounds that in allowing for increased aircraft movements and noise the decision removed an advantage from local people which could legitimately be expected to continue, the IATA acting on behalf of its member airlines challenged the Secretary of State’s decision and applied for judicial review.

8) Sonic boom is defined by ICAO Sonic Boom Committee as “the acoustic event which is a manifestation of the shock wave system generated when [an aeroplane] flies at a speed greater than the local sound velocity”. The Committee concluded that States have the right to regulate supersonic flights over their own territory but cannot prohibit supersonic flights outside their territory including the high seas.[[38]](#footnote-38)

**Other Environmental concerns**

A different situation arises when aircraft are used in agriculture for crop spraying and crop dusting. This is environmental damage caused by careless crop-dusting and strict precautions and rules have to be observed and enforced. Not only damage is caused by spraying of wrong kind of chemicals but also wrong piece of land may be dusted. Animals may be affected as well. There is a damage caused by low-over flights[[39]](#footnote-39).

**Damage caused by noise and sonic Boom**

The spectacular developments in aviation since the end of the second world war have been highlighted previously on several occasions and the great benefits they have brought to the world are obvious and there for all of us to see and enjoy. They must however be weighed against the discomfort and the damage caused by some of its side-effects particularly noise and sonic boom. With industry and motorized transport contributing their share to endangering the environment in the densely populated areas the incident of noise have already been introduced common standards and arrangements sanctioned by the international agreements are still sadly lacking. It is an old principle of law dating from Roman days and referred to earlier in this treatise which forms the backdrop against which the problem of noise must be set: the rule of *Cujus est solum, ejus est ad coelum et ad inferos.* This has been upheld in law courts all over the world until as recently as the 1960s. Meanwhile international agreements had been concluded to cover damage caused by aircraft on the surface notably the Rome Conventions of 1933 and 1952. In the later Convention the operative term related to ‘aircraft in flight’ under Article 1 is being understood that ‘in flight’ is to be interpreted as ‘normal flight’ i.e. a flight in accordance with rules of the air. Pursuant to this interpretation it is clearly impossible to apply the Convention to sonic boom because supersonic aircraft may cause damage even when flying in conformity with rules of the air. Excessive noise may be caused by 1) aircraft passing through the airspace; 2) take-offs and landings affecting areas adjacent to airports and 3) test flights affecting those areas. In 1952 the year in which Rome Convention was concluded the damage jet aircraft might cause on the surface could not be predicted which is one of the reasons why that Convention is not an appropriate instrument to deal with problem.[[40]](#footnote-40) To solve problems on an international level two procedures have been contemplated. One was to amend the Chicago Convention; the other suggestion for a way out was to modify the 1952 Rome Convention. An amendment to Chicago Convention could have been brought about on the basis of Article 94; it would have involved modifying the Annex 8 on airworthiness in such a way as to make the issuing of certificates of airworthiness contingent upon meeting certain standards of noise level. Such a solution would however be hampered by the fact that in order to become effective the amendments to the Convention would have to secure ratification by a two-thirds majority. A similar obstacle would have to be overcome in attempts to revise the Rome Convention. Admittedly the number of states is much smaller but the opportunity would probably be seized upon to open discussions on other controversial matters concerning the Convention. Amending the Convention would have been of little use in ‘normal flight’. The matter was discussed in Legal Committee of the ICAO General Assembly in 1980. Having noted work of Sub-committee on the Revision of the Rome Convention in 1975 and also that the Sub-Committee on the problems of Liability for Damages Caused by Noise and Sonic Boom in 1978 had not considered this subject ripe for consideration was to be postponed for an indefinite period.[[41]](#footnote-41) Another procedure to solve the problem would be to create a new instrument on noise and sonic boom. This suggestion was considered at the 1976 session of the ICAO Legal Committee where opinions turned out to be strongly divided on the subject. It was decided on whether or not to adopt an entirely new instrument was to be referred to a subcommittee specially extended for the purpose and that it is terms the meantime, information on the subject was going to be collected from states and from various other sources. This information would be commented on by states and then submitted to the sub-committee in the form of recommended solutions.[[42]](#footnote-42)

In order to combat the effects of aircraft noise, especially in density populated areas legislative measures have already been introduced in several countries. Besides this case law have created precedents and played a useful role in providing relief for those suffering from excessive noise. Once again there is notable difference in legal practice between European countries on one hand and United States on other.

In the case of *Cie. Air France v Ste`ERVE et al.* Cour de Cassation[[43]](#footnote-43) the facts of this case were in Nice (France) a high-rise apartment building had been constructed on the outskirts of the city but the apartments were difficult to sell because of noise produced by jet aircraft using Nice airport. An action was filed against the operator of the airport, the Chamber of Commerce. The court ruled that it had no jurisdiction to hear the case because the Chamber of Commerce was a public corporation set up by French Government. The case should therefore have been brought before *Conseil d’ Etat*. The builder of the apartment building subsequently filed a claim against Air France, although that company was only one of the many users of the airport and the residents also sued for compensation. Air France was required to assume the burden of proof and to demonstrate that the noise caused by its aircraft did not in fact exceed legal limits. The court decided eventually that the operator of the aircraft was liable for damage caused by manoeuvrings of the aircraft. The attitude of French courts towards compensation for damage of this kind seems to be more lenient than in common law countries notably United States. In US proceedings are based on one of the following grounds: 1) trespass 2) nuisance; 3) unconstitutional taking.

Courts have frequently based on trespass in cases of direct overflight of the plaintiff’s property. Their advantage was that trespass is actionable per se contrary to nuisance where abnormal discomfort has to be demonstrated. The idea of trespass in the airspace above someone’s land stems from the Roman adage which has played a significant part in air law in general. However in the *Hinman* case[[44]](#footnote-44) it was ruled that this was not the law and had never been. The court observed that:

*We own so much of the space above the ground as we can occupy or make use of in connection with enjoyment of our land. This right is not fixed. It varies with our varying needs and is co-extensive with them. The owner of the land owns as much of the space above him as he uses but only so long as he uses it. All that lies beyond belongs to the world.*

*The case differs from the usual case of enjoining a trespass. Ordinarily if a trespass is committed upon land the plaintiff is entitled to atleast nominal damages without proving or alleging any actual damage. In this instant case traversing the airspace above the appellant’s land is not of itself a trespass at all but it is a lawful act unless it is done under circumstances which will cause injury to appellant’s possession.*

Clearly the advantage of trespass as basis of obtaining compensation in cases of overflight had been undone by this judgment. In *Causby* case[[45]](#footnote-45) trespass was not upheld either. The court ruled that private ownership of airspace was not acceptable in modern world and that airspace formed part of the land owner owns at least as much of the space above the ground as he can occupy or use in connection with the land.

Nuisance another ground used in connection with damage caused by aircraft noise ‘may be defined as any act or omission which interferes with the enjoyment by another of his health, comfort, or convenience in the occupation of his land. Nuisance caused by noise is usually recognized by the courts only if it is continuous or repetitive and provided that sensible discomfort and annoyance have been caused to the owner of the property.

The main legal ground used in the United States to obtain compensation is ‘unconstitutional taking’. It was used in 1946 in the case of the *United States* v *Causby* (cited above). The court held that frequent flights and the interference they caused equaled the taking of an easement for which compensation was due. However it was added that the airspace apart from immediate interference with enjoyment and use of the land. The line taken in the *Causby* case was further qualified in *Batten* case[[46]](#footnote-46) where direct overflight was made a requirement before compensation could be obtained. The 1964 *Martin* case[[47]](#footnote-47) and in Oregon the 1962 *Thronburg* case[[48]](#footnote-48) has compensation been granted for excessive noise affecting landowners.

Whether repeated overflights do or do not constitute ‘unconstitutional taking’ on a particular property depends on three factors according to the *Causby* judgment: 1) the character of the land itself; 2) the altitude of the flights; 3) the frequency of the overflights. Claiming unconstitutional taking has been successful in American Courts when the inconvenience was so serious that it was considered to equal taking of an easement for which compensation was due. Regular low overflights in the airspace over the plaintiff’s property have been construed as such. While considering these cases it must not be forgotten that physical damage may be caused purely incidentally as a result of aircraft noise.

**Against whom may an action for compensation be directed:**

As shown in case of Nice, France and also in cases in United States it is possible to sue the operator of the aircraft noise. It is however questionable whether this is always the case because airlines are obliged by law to land on specially designated airfields (Chicago Convention). Another possibility is to sue operator of airport but it can be argued on behalf of such operator that it is not the airport that caused the noise.

Finding insurance for the risk of damage resulting from aircraft noise and sonic boom is not easy because it is virtually certain that noise can cause damage.

With aircraft being regarded as an ordinary means of transport, some measures of tolerance may be expected from the public. However many countries have introduced legislation to cope with the problem while others are preparing for it. Some countries have introduced ‘zoning’ whereby building in the vicinity of airports has been made contingent upon noise levels in the area; other measures include restricting night flying or making certain runways conditional upon the wind direction.

**Principle of sustainability**

The current production and consumption systems across the world have different impacts on the natural systems that sustain life on earth. Mankind is a part of such constantly evolving system. In today’s age we are denuding the resources of the planet as never before and endangering the very future.[[49]](#footnote-49) The term sustainability triggers a similar response to the term justice.

The principle of sustainability sets jurisprudence and law-making institutions on a new path. International law can no longer be perceived as a contractual arrangement purely between states and national law no longer as a purely domestic affair. Both levels penetrate each other. And as global environment is perceived as our common home, legal instruments and principles will have to accommodate ecological citizenship.[[50]](#footnote-50)

**The sustainability of the Transport system:**

As transport has always played a crucial role in the evolution of society and human kind. It has on one hand provided clear socio-economic benefits, on the other it has generated socially and environmentally adverse effects. Sustainable transportation has been defined as:

*Sustainable transportation is that, which does not endanger health or ecosystems and that meets needs for access consistent with a) use of renewable resources that are below their rates of regeneration and b) use of non-renewable resources below the rates of development of renewable substitutes.* (OECD, 2001)

The goal of sustainable transport is to ensure that environment social and economic considerations are factored into decisions affecting transportation activity (TC, 1999).

In transport system the generally accepted definition of sustainability of the air transport system is still lacking. Nevertheless over last two decades dealing with sustainability of the system has been consolidated as important part of agenda for all concerned actors which have opened a vast range of interpretations. The concept of sustainability has often been used in narrow sense reflecting eco-efficiency which has embraced only two parameters-greenhouse gas emissions and noise. The concept of costs of environmental and social damages has been elaborated in academic circles and has little practical application.

The OECD has developed a set of 10 guidelines for sustainability of the transport sector in the Environmental Sustainability Targets (EST) which was presented in May 2001 at the meeting of Environmental Ministers.[[51]](#footnote-51) The UN has used the general approach to sustainability and the air transport sector sustainability has been delegated to ICAO (International Civil Aviation Organization). Further EU has identified four main issues for integration of strategic environmental concerns into air transport policy as i) improving environmental standards on noise and emissions, ii) strengthening the economic and market incentives; iii) assisting airports in dealing with environmental problems and iv) improving technology in the long term. Different operators deal with the sustainability issue differently as in for instance the airline include this into their business models while airports have implemented policies and measures to mitigate environmental impacts.

**Conclusion:**

Technological developments have resulted in many changes in the most popular mode of travel over the last 200 years. In this period, the primary vehicle for long distance travel has changed first from horse drawn carriage to the railways, then from the railways to the private automobile, and finally from the private automobile to the airplane. Plane travel has undergone spectacular development in the last half of the 20th century, and has brought nations and all of humanity closer together, thus making our Earth a small planet. Because of its convenience and speed, today the airplane has become the most commonly used vehicle by most people in the developed world, and a rapidly increasing number of people in the developing world, for trips longer than a few hundred miles. Industry’s astounding growth is continuing. In US there exists deregulation-a phenomena which is gradually spreading worldwide. Manufacturers are building airplanes that carry up to 500 passengers, have 700 to 800 passenger airplanes on the drawing board, and are even discussing very large transports that will carry up to 1000 passengers. In most part of the world capacity of both the ground and in the air are real problems. Expanded supersonic air travel is very much in the future. But all this has not been without a price and the price is paid in terms of environment degradation. However still there can be little doubt that air transport is still an extraordinary dynamic industry.[[52]](#footnote-52) Rapid increase in human population, increasing urbanization and dispersal of each ethnic group over widely separated geographic regions, are contributing to a steep growth in the demand for plane travel. This growth rate is high in developed countries, and somewhat lower in developing countries. This growth in the demand for plane travel in turn is leading to tremendous increases in the construction of huge airport facilities, the development of large jumbo and superjumbo jet airplanes, and ultimately in the number of flights taking off daily from airports. At almost all major airports in developed countries, there is usually a plane taking off or landing every 10 seconds round the clock. Balancing sustainability in the air transport sector should be done both at global and local levels.

It is an important time for both the air transport industry and the academic research and policy community even though the current air transport system is changing relatively rapidly. Nevertheless the scale and scope of impacts of such growth on society and environment will continue to be increasingly a matter of concern. It is a fact that many people prefer air travel rather than ground or water transportation. This has prompted a critical look at safety and quality control. Contribution to air pollution is a chief concern because of this revolutionary change in public transportation around the world. The governments of nations around the globe must also establish standards for exhaust emissions. Thus manufacturers should be forced to develop low-pollutant engines.

1. <http://ntl.bts.gov/DOCS/tte.html>, (28th March 2012). [↑](#footnote-ref-1)
2. Harry W. Orlady, Linda M. Orlady, Human Factors in Multi-Crew Flight Operations, p. xvii. [↑](#footnote-ref-2)
3. <http://www.yale.edu/ynhti/curriculum/units/1988/6/88.06.06.x.html>, (29th March 2012). [↑](#footnote-ref-3)
4. Milan Janic’, The Sustainability of Air Transportation, preface pp. xv-xviii. (ASHGATE) [↑](#footnote-ref-4)
5. Ludwig Weber, International Civil Aviation Organization, pp. 75-79. (Kluwer Law International) [↑](#footnote-ref-5)
6. Ibid n. 4. [↑](#footnote-ref-6)
7. <http://www.areco.org/pollute.htm> (28th March, 2012) [↑](#footnote-ref-7)
8. Ibid n. 3. [↑](#footnote-ref-8)
9. Ibid n. 5. [↑](#footnote-ref-9)
10. Aircraft Noise, including noise certification standards in ICAO’s Policies on Charges for Airports and Air Navigation Services in Annex 16, Vol II: Aircraft Engine Emissions. Airport Planning Manual, Part 2: Land Use and Environmental Control. [↑](#footnote-ref-10)
11. A35-5, Appendix C:Policies and Programmes Based on a ‘Balanced Approach’ to Aircraft Noise Management, [previously A33-7]; Guidance on the Balanced Approach to Aircraft Noise Management. [↑](#footnote-ref-11)
12. Assembly Resolution A33-7, which was superseded by Assembly Resolution A35-5. [↑](#footnote-ref-12)
13. A35-5, Appendix C, Operating Clause 2 (b). [↑](#footnote-ref-13)
14. A35-5, Appendix C, Operating Clause 3(b)-(d) [↑](#footnote-ref-14)
15. Assembly Resolution A35-5, Appendix D: Phase-out of Subsonic Jet Aircraft which Exceed the Noise Levels in Volume I of Annex 16, Operating Clause 1 (a)-(d). [↑](#footnote-ref-15)
16. A35-5, Appendix C, Operating Clause 2 (a)-(d). [↑](#footnote-ref-16)
17. A35-5, Appendix C, Operating Clause 3 (d); see also Appendix E. [↑](#footnote-ref-17)
18. A35-5, Appendix F, Operating Clause 3 (a)-(d). [↑](#footnote-ref-18)
19. A35-5, Appendix H: Environmental Impact of Civil Aviation on the Atmosphere, third whereas clause; on the impact of the report on ICAO policy. [↑](#footnote-ref-19)
20. A35-5, Appendix H. [↑](#footnote-ref-20)
21. Operational Opportunities to Minimize Fuel Use and Reduce Emissions, Circular 303; A35-5, Appendix H, Operating Clause 2(d). [↑](#footnote-ref-21)
22. Tim Unmack, Civil Aviation: Standards and Liabilities, pp. 191-193. (LLP Limited, UK) [↑](#footnote-ref-22)
23. A35-5, Appendix H, Operating Clause 2 (c)2. [↑](#footnote-ref-23)
24. Supra n.5, pp. 75-79. [↑](#footnote-ref-24)
25. Philippe Sands, Principles of International Environmental Law, 2nd ed. 2009. Cambridge University Press. [↑](#footnote-ref-25)
26. Council Directive 80/51/EEC, OJL 18, 24 January 1980, 26 as amended; Council Directive 89/629/EEC, OJL363, 13 December 1989, 27. These comply with standards set by the ICAO. Directive 92/14/EC, OJL 76, 23 March 1992, 30 provides for a ban as of 1995 of civil subsonic aircraft that do not comply with ICAO requirements. On the reconciling of trade and environment in respect of aircraft; see case C-389/96, *Aher-Waggon GmbH* v *Bundesrepublik Deutschland* [1998] ECR I-4473. [↑](#footnote-ref-26)
27. OJL 24, January 1980, pp. 26-28 [↑](#footnote-ref-27)
28. OJL 117, 4 May 1983, pp. 15-17 [↑](#footnote-ref-28)
29. OJL 363, 12 December 1989, pp. 27-29 [↑](#footnote-ref-29)
30. Chapter 3- Subsonic jet aeroplanes and certain categories of propeller-driven aircraft:

    This chapter refers to-

    1. Subsonic jet aeroplanes-application for certificate of airworthiness accepted on or after 6 October 1977.
    2. Propeller driven aeroplanes over 5700 kg-application for certificate of airworthiness for the prototype accepted on or after 1 January 1985 and before 17 November 1988.
    3. Propeller-driven aeroplanes over 8618 kg- applications for certificate of ariworthiness for the prototype accepted on or after 17 November 1988.

    [↑](#footnote-ref-30)
31. OJL 76, 23 March 1992 pp. 21-27 [↑](#footnote-ref-31)
32. OJL 85, 28 March 2002, pp. 40-46. [↑](#footnote-ref-32)
33. Prof Dr. I.H.Ph Diederiks-Verschoor, M.A Butler, An Introduction to AIR LAW, 8th ed. 2006, pp. 96-99. [↑](#footnote-ref-33)
34. OJL 189, 18 July 2002, pp.12-26. [↑](#footnote-ref-34)
35. For sleep disturbance see the UK department of Transport Report of a field study of Aircraft Noise and Sleep Disturbance (December 1992).Pages 36-37 list the reference publications. [↑](#footnote-ref-35)
36. 24 January 1997, RG 1996/AR/2547; (1998) XXIII Air Law No. 1 [↑](#footnote-ref-36)
37. (No 4) ([1996] 4 All ER 93) [↑](#footnote-ref-37)
38. ICAO doc. 9011 SBC/1 1972. For Pollution, see practical application of anti-pollution restrictions, for example in UK in the Civil Aviation Act 1982, Air Navigation (Aircraft and Aircraft Engine Emissions) Order 1986 and Air Navigation (Aeroplane and Aeroplane Engine Emission of Unburned Hydrocarbons) Order 1988. [↑](#footnote-ref-38)
39. I.H.Ph. Diederiks-Verschoor, Aviation’s Impact on Agriculture and its Animal Habitats’ Pertanika Journal of Social Sciences & Humananities, Vol. 6 (1998), No 2 pp. 125-132. [↑](#footnote-ref-39)
40. Supra n.33, Surface damage and Collisions, pg 231-238. [↑](#footnote-ref-40)
41. Docs. 23rd session of ICAO Legal Committee Montreal, Feb 1978 Air law Vol. VI 1981, pp. 53-56 at 55. [↑](#footnote-ref-41)
42. 22nd Session of the ICAO Legal Committee Montreal Oct-Nov 1976. [↑](#footnote-ref-42)
43. (2e Ch. Civ), 8 May 1968; [1968] RFDA 327. [↑](#footnote-ref-43)
44. *Hinman* v *Pacific Air Transport;* *same* v *United Airlines Transport Corp*. US Court of Appeals (9th Circuit), 20 July 1936; 1 Avi 640; [1936] USAvR, 1; [1936] JAL, 624. [↑](#footnote-ref-44)
45. *United States* v *Causby*, US Supreme Court, 27 May 1946; 2 Avi 14, 189; [↑](#footnote-ref-45)
46. *Batten* v *United States*, US Court of Appeals (10th Circuit), 10 July 1962; 8 Avi 17, 101. [↑](#footnote-ref-46)
47. *Martin* v *The Port of Seattle,* Washington Supreme Court, 23 April 1964; 8 Avi 18,324. [↑](#footnote-ref-47)
48. *Thornburg* v *The Port of Portland*, Oregon Supreme Court, 7 November 1962; 8 Avi 17, 281; [1962] USAvR, 448. [↑](#footnote-ref-48)
49. Philippe Sands, Principles of International Environmental Law, 2nd ed. 2009. (Cambridge University Press). [↑](#footnote-ref-49)
50. Klaus Bosselmann, The Principle of Sustainability, p.7. [↑](#footnote-ref-50)
51. Supra n. 4, p. 3-11. [↑](#footnote-ref-51)
52. Supra n. 2, Our Heritage in Air Transport, p. 22. [↑](#footnote-ref-52)