AIR POLLUTION AND ANALYSIS OF ENVIRONMENTAL LAWS ON AIR POLLUTION IN PAKISTAN

By

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A thesis submitted in partial fulfillment
of the requirement for the degree of
"MASTERS OF LAW"
(1427/2006)

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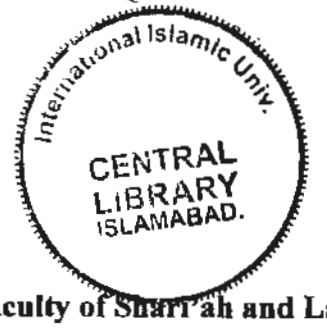

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1 - Pakistan Environmental Protection Act

2 Environmental Law - Pakistan

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LIST OF ABBREVIATIONS

AIT	Asian Institute of Technology
COP	Conference of Parties
CFCs	Chlorofluorocarbons
EAP-AP	Environmental Assessment Programme for Asia and Pacific
EEC	European Economic Countries
GHGs	Green House Gasses
HCFCs	Hydrochloroflurocarbons
HBCFs	Hydrobromofluorocarbons
ICJ	International Court of Justice
IMF	Interim Multilateral Fund
JICA	Japan International Co-operation Agency
MOP	Meeting of Parties
ODS	Ozone Deplete substances
PM	Particulate Matter
PEPC	Pakistan Environmental Protection Council
PEPA	Pakistan Environmental Protection Agency
PPC	Pakistan Penal Code, 1860

SEI	Stockholm Environment Institute
SPM	Specific Particulate Matters
SACEP	South Asian Co-Operative Environment Programme
SIDA	Swedish International Development co-operation
SBSTA	Subsidiary Body for Scientific and Technology Advice
UNFCCC	United Nation Framework convention on climate Change
UNEP	United Nation Environment Programme
VOCs	Volatile Organic compounds
WHO	World Health Organization

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DEDICATION

I dedicate this thesis to my affectionate parents and especially to my elder brother Ch. Muhammad Aslam Gondal who always proved to be a source of inspiration for me with all his boundless love and consistent care.

ACKNOWLEDGMENTS

I am deeply indebted to Allah Almighty, my parents, family and teachers who contributed to the completion of this thesis. Many many thanks are due to my supervisor Mr. Tariq Bilal, Advocate Supreme Court of Pakistan who guided me in the course of this research and has always been available to extend every possible help. His meticulous scrutiny, sustained monitoring, and extremely cooperative demeanor make it virtually impossible for me to express my gratitude adequately. And he also allowed me a free access to his most valuable collection of books and other useful materials. Without his help the completion of this research would not have been possible. I would also record my deep gratitude for all-out help extended to me by Professor Muhammad Munir, Faculty of Shariah and Law. His generous guidance facilitated my work a lot.

I am also obliged to thank my friends and colleagues Mr. Shafqat Mehmood Khan, Malik Farrukh Abbas and Saif Ullah who have always been available to assist and facilitate me. I am extremely grateful to staff members of Pakistan Environmental Protection Agency Library, Islamabad and Syed Zaheer Ahmad Gillani, National Project Manager of POPs and enabling activity project, for guidance and providing me relevant materials. Besides, I am also grateful to Raja Ansar Abbas, Malik Zulfiqar, Rai Azhar Iqbal Kharral, Shahid Iqbal Gondal, Tariq Mahmood Rizvi and all the other friends and colleagues for their help and good wishes.

ABSTRACT

AIR POLLUTION AND ANALYSIS OF ENVIRONMENTAL LAWS ON AIR POLLUTION IN PAKISTAN

By

Muhammad Saif Ullah

Man is the most beautiful creature of Allah Almighty and only his existence in the world is not enough but his existence with all life support is important and desirable. Environment is indeed the common heritage of humanbeings. It is not the responsibility of those industrial nations only who played a vital role for environment destruction. Human survival may lead to gradual suicide through environmental pollution.

Air is one of the bounties of the nature which has been gifted by Allah Almighty. Without air existence of human beings is impossible. It is the duty of mankind to protect the nature and to live on the surface of the earth with great care, diligence and harmony so as not to harm other livingbeings. Our natural atmosphere/air is already polluted due to highly inefficient energy use, growth in vehicular population, industrial activities, thermal power plants, open burning of solid and medical waste including plastic and use of ozone depleting substances (ODSs).

Ambient air quality data shows that carbon monoxides levels in the big cities of Pakistan like Karachi, Lahore and Peshawar have crossed the guidelines provided by the WHO. Impacts of air pollutions not only on human health/life and animals but also on non-living things like plants, agriculture, material and structure of buildings.

In Pakistan, there are laws on air pollution Like Pakistan Environmental Protection Act, 1997 but there is no proper implementation of these laws. There is also lack of awareness about laws as well as about pollution. So, there is need to ensure the implementation of these laws and also need to guide the people about the information of air pollution through electronic and print media. Society can perform vital role in the reduction and control of the evil of air pollution.

The basic purpose of my research work is to write on air pollution and to analyze the environmental laws on air pollution in Pakistan. Whether these laws fulfill the commitments under the international agreements which have been signed or ratified by Pakistan? Whether these laws are sufficient to control or reduce the air pollution?

The scope of this research work is limited to air pollution laws which are applicable in Pakistan and International agreements which are signed and ratified by Pakistan and Pakistani case law study. Therefore, these areas have been discussed according to the subject matter.

In first chapter, Air pollution has been briefly discussed including constituents of air, sources and impacts of air pollution. Next chapter is followed by international agreements on air pollution signed or ratified by Pakistan. Similarly, chapter three addresses environmental laws on air pollution in Pakistan. The next chapter consists of a case law study on air pollution by Pakistani courts. Then the thesis ends with the conclusion and recommendations.

CHAPTER 1

AIR POLLUTION

A INTRODUCTION

Pakistan is an agricultural country where rainfall ranges from as low as 80 mm in the South to as high as 1600 mm in the North. The wind speed which is essential for flushing of pollution is also low in our country. In days of dry and low wind natural dust and anthropogenic pollution takes more time to disperse off. Over the last few years the average rainfall has declined in many parts of the country. The level of suspended particles matters and other pollutants increases due to prevalent dry air conditions.[1]

Air pollution is an emerging environmental issue in developing countries like Pakistan and has required attention from different corners. Air pollution is not only a local problem but also a global environmental issue for all countries. So, air pollution requires attention on large scale and to think from narrow local context to broad global environment. The "global" does not necessarily imply that the pollution in question encompasses the whole world. Similarly, air pollution problem occurs in various locations. The occurrence of air pollution beyond geographical formalities has made the problem universal, drawing attention from inhabitants of all regions of the world.

The primary cause of air pollution is the man himself as the population increases, so does the air pollution problem directly proportionate with the growth in population rate. The significant

[1] Air Quality, http://www.environment.gov.pk/pub-pgf/AirQltyEmissionstd.pdf, (last visited 28-04-06).

change in man's effect on nature came with the discovery of fire. Man burnt a fire in his cave for cooking, heating and light. The problem of air pollution came into existence at that time.[2]

Generally air pollution means the presence of foreign substances in the air. There are some definitions of air pollution given by the different health & environmental institutions of the countries.

> Air pollution means the presence in the outdoor atmosphere of one or more contaminants such as dust, fumes, mist, odour, smoke or vapor, in quantities with characteristic and of duration such as to be injurious to human, plant, or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life and property.[3]

> Air pollution is the presence in ambient atmosphere of substances, generally resulting from the activity of man, in sufficient concentration, present for a sufficient time and under circumstances which interfere significantly with the comfort, health, or welfare of persons or with the full use or enjoyment of property.[4]

> Air pollution is the excessive concentration of foreign matters in the air which adversely affect the well being of the individual or cause damage to property.[5]

> Air Pollution means by man, directly or indirectly, of substances or energy into the air resulting in deleterious effects of such a nature as to endanger human, harm living resources and ecosystem and material property and impair or interfere with amenities and other legitimate uses of the environment.[6]

Similarly air pollution differs from people to people. Air pollution causes eye irritation for the house holders, destroys the farmer's vegetation, affects the visibility of a pilot and creates problems for the people working in industries. The problem of air pollution varies from place to place. For example, air pollution in Islamabad is not the same as that in Lahore or in Peshawar.

It has been found that the significantly increasing volume of particular matter entering in the atmosphere scatters the incoming sunlight. This reduces the amount of heat that reaches the

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[2] Godish, *Thad, Air Quality*, 4th edition, (Lewis publishers, A CRC Press Co. 2004), p. 149.
[3] Engineers Joint Council, U.S.A.
[4] Indian Standards Institution IS-4167 (1966).
[5] American Medical Association.
[6] Article 1(a), Convention on Long-Range Transboundary Air Pollution, 1979.

earth and tends to reduce its temperature. The decrease means that the global temperature of recent years has been attributed to the rising concentration of air-bourn particles in the atmosphere. A counter acting phenomenon commonly refers to as the "green house effect"[7] is caused by the increasing amount of carbon dioxide found in the atmosphere. It has been estimated that if the carbon dioxide content in the atmosphere generated in combustion processes continues to increase at the present rate, global temperature could rise by 4 ċ in the next decades. There has been conjecture that this might become a matter of great importance because small temperature increase could result in a partial melting of the ice caps of the earth causing continental flooding and devastating effects on man.[8]

Another cause of air pollution is the fuel combustion in various sectors like domestic use, power generation, transport, and industries. It is also caused by flood, municipal solid waste, odour, vapour, grit and deforestation. As industry has expanded, factories emit more and more toxic effluents in the air.

Emissions from vehicles are also considered to be major source of air pollution. As compared to other developing countries, the number of vehicles in Pakistan has increased fastly in recent years from 680,000 in 1980 to 5.2 million in 2004[9] showing an overall increase of 635 %. It is claimed that average Pakistani vehicle emits 25 times as much carbon dioxide as the average U.S. vehicle, as well as 20 times as many hydrocarbons and more than 3.5 times as many nitrous

[7] Warming of the earth's atmosphere resulting from the absorption of thermal energy emitted from the earth's surface.
[8] Mnrao, Hvnrao, *Air Pollution*, (Tata McGraw-Hill Publishing Company Limited, New Delhi, 2003), p.10.
[9] Abedullah, Dr., *Development without environmental pollution*, Dawn, May 9, 2005, http://www.dawn.com/2005/05/09/ebr16.htm (last visited 28-04-06).

oxides in grams per kilometer.[10] Given the lack of enforcement of motor vehicle fitness regulation, the increase in air pollution from the vehicles population alone could be alarming.

Many Pakistani experts on environment say that poor fuel quality is also a source of air pollution. Fuel consumption rose by 188 % in Pakistan from 1980 to 1998 and gasoline continues to contain high levels of lead and sulfur. Unleaded gasoline was introduced in 2001 but many vehicles in major cities still use leaded gasoline.[11]

Air pollution is considered to be primarily an urban problem in Pakistan. With the increases in urbanization, air pollution level also increases significantly. Transport and energy sectors are considered to be the major air polluters. Road transport causes more urban air-borne pollution than any single human activity. Transport and energy sectors contribute nearly 1/2 (one half) of the oxides of nitrogen (NO_2), 2/3 (two third) of carbon monoxide (CO) and 1/2 (one half) of hydro carbons (HC) in the industrialized countries.[12]

In rural areas, air quality is considered to have been negatively affected in areas abutting industrial estates or isolated industrial plants setup outside city limits. Brick kilns, where the fuel used is often, high sulfur coal are acknowledged as a major source of air pollution in the suburbs.[13]

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[10] The National Conservation Strategy Report, 1992.
[11] *Pakistan: Environmental Issues*, August, 2003.
http://www.eia.doe.gov/emeu/cabs/pakenv.html (last visited, 28-04-2006).
[12] Qadir, Dr. Noman Fazal, *Air Quality in Urban areas in Pakistan Vs Transport Planning: Issues and Management tools*
www.adp.org/documents/Events/2002/RETA5937/Manila/downloads/tp_16B_Qadir.PDF
(last visited 28-04-06).
[13] The National View of Air Pollution,
http://www.rrcp.org/issues/air/maledec/baseline/Baseline/Pakistan/pakch1.htm (last visited 28-04-06)

Various surveys show that level of air pollution has crossed the safe limits and has been declared to be much high by the World Health Organization (WHO) guideline in the major cities of Pakistan. The study shows that the average suspended particulate matters in our cities were 6.4 times higher than WHO guidelines and 3.8 times higher than Japanese standards. The levels of sulfur dioxides, oxides of nitrogen and carbon monoxide were found in excess of acceptable standards in some arcas but the average levels were found below WHO guidelines.[14]

The level of air pollution in two major cities Karachi and Lahore is 20 times higher than WHO standards and continues to rise. Islamabad is smothered by a thick cloud of smog that hides views of the Margalla Hills.[15]

Air pollution negatively impacts on the health[16] problems being faced by humans, animals, and fish etc. It also disrupts vegetation and forest growth, cause damage to soil, changing climate and regular patterns of seasons, rains, floods, drought, desertification, deforestation, global warming, ozone layer depletion, acid rain effects, material and building structures and cultural and archaeological monuments associated with high levels of oxides and has resulted in depletion of the scarce natural resources needed for long term sustainability of ecosystem.[17]

Vehicles are the leading source of air pollution that affects the economy and people's living standards. According to a study, Pakistan is losing 25 % of its potential crop production due to air pollution[18] Economic damages resulting from urban air pollution are estimated are about $ 370 million per annum, 6.4 million people are hospitalized annually due to illnesses. This cost is

[14] Japan International Co-operation Agency Report, 1999.
[15] Pakistan, http://www.eia.doe.gov/emeu/cabs/pakenv.html.
[16] Under the definition of WHO, health includes physical, mental and social well being and not merely the absence of disease or infirmity.
[17] Mnrao, p. 43.
[18] Study conducted by Brandon of World Bank in 1992-93 and updated by Mathew in 1997.

associated with expenditures on health, economy and production losses due to absentees in factories, offices and schools.[19]

A. CONSTITUENTS OF AIR

Air is a mixture of number of gases each of which has its own characteristics like carbon dioxide (CO_2), nitrogen oxide (N_2O), oxygen (O_2), argon, neon and helium etc. Various amounts of contaminants continuously enter the atmosphere through both natural and man made processes that exist upon the earth.

The following table shows the ratio of different gases in the air:

Ratio of Gases in the Air[20]

S. No	Gases	Ratio
1.	Nitrogen	78.084%
2.	Oxygen	20.946%
3.	Argon	0.934%
4.	Neon	0.0018%
5.	Helium	0.000524%
6.	Methane	0.0002%
7.	Krypton	0.000114%
8.	Xeon	0.0000087%

Table: 1.1

[19] Abedullah, http://www.dawn.com/2005/05/09/ebr16.htm.
[20] The New Encyclopedia Britannica, Vol. 1, (Encyclopedia Britannica, Inc.), p. 173.

When their ratio is changed due to any reason then it causes air pollution.

The earth is surrounded by air which performs an important role for sustaining the life of this planet. It is an essential requirement for living beings on the earth.

Air is mixture of gasses surrounding the earth and breathed by all humans, animals and plants. There are a number of gases in the air which are part of it but most of these gases are noble or annul gases which do not affect the atmosphere or the environment. There are some gasses which have more volume in the air and these are also called constituents of air. [21]

The major gasses constituting the air are discussed below:

1. Nitrogen (N_2)

Nitrogen is the most abundantly present constituent of the atmosphere. It is a colorless, odorless and tasteless gas. It is nonflammable and does not support combustion. The gas is slightly lighter than air and slightly soluble in water. Atmosphere contains 78.084 % nitrogen by volume or about 75 % by weight. It has relatively limited direct role in atmospheric and life processes.[22]

It forms nitric oxide and nitrogen sulfide with oxygen, ammonia with hydrogen and nitrogen sulfide with sulfur. In combination with halogens nitrogen can form explosive compounds.

[21] Hassan, jawad, *Environmental Laws of Pakistan*, (Book Biz Lahore Pakistan, 2006), p. 41.
[22] Encyclopedia Britannica, vol. 8, p. 727.

The conversion of nitrogen to N_3 occurs as a result of atmospheric and symbiotic processes. Nitrogen condenses at its boiling point, -195.8c, to colorless and odorless liquid that is lighter than water. Nitrogen is separated from air by distillation, absorption or diffusion[23].

a. Application of Nitrogen gas in different sectors[24]

Nitrogen gas is used in the following sectors for different purposes.

i. In the Chemical Industry

The chemical industry makes wide use of nitrogen as a raw material for the synthesis of ammonia and urea in the production of agricultural fertilizers.

ii. In the Food Industry

The inert properties of nitrogen make it a good blanketing gas in the chemical and metallurgical industries. These properties are also useful in the food industry as are the low temperature properties of nitrogen.

iii. Protection against Fire and Explosive Substances

Flammable and explosive substances are used in almost all branches of chemical industry. Some of them have such properties that must be protected from atmospheric oxygen and moisture. This protection can be supplied by nitrogen or in some cases by carbon dioxide. Refineries and petrochemical plants and marine tankers use nitrogen to purge equipment, tanks, and pipelines of dangerous vapours and gases. It is also used for the tank storage of flammable liquids.

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[23] Universal Industrial Gasses, www.uigi.com/nitrogen.html, (last visited 26-04-2006)
[24] Universal Industrial Gasses, www.uigi.com/nitrogen.html.

iv. Medicine of Human and Veterinary

Nitrogen is used to freeze blood, viruses for vaccination. It is also used to freeze livestock semen, which can be stored for years.

v. Cooling of Chemical Reactions

Cooling with liquid nitrogen permits rapid temperature reduction. It is used to cool concrete, which shortens the setup time.

vi. Ground Freezing

When work is to be done in soft, water-soaked ground such as tunnel construction underneath waterways, the ground can be frozen effectively with liquid nitrogen. Pipes are driven into the ground liquid nitrogen is pumped through the pipes under the earth's surface. When the nitrogen exits into the soil, it vaporizes, removing heat from the soil and freezing it.

Nitrogen gas is also used during melting process in the manufacture of steel and other metals and as a shield gas in the heat treatment of iron, steel, and metals.[25]

2. Oxygen (O_2)

The constituents of oxygen were discovered iu about 1772 by a Swedish chemist, Carl Wilhelm Scheele. Who used to obtain it by heating potassium nitrate, mercury II oxide, and many other substances.[26]

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[25] Nitrogen, www.uigi.com/oxygen.html.
[26] Encyclopedia Britannica, vol. 9, p. 35.

Oxygen is fundamental to the life of living beings. This is the system of Allah Almighty that humans take oxygen from atmosphere and return carbon dioxide and plants assimilate carbon dioxide in the presence of sunlight and return oxygen. Thus oxygen is available in the atmosphere in abundance.

Oxygen is a life sustaining active component of the atmosphere. It comprises 20.94 % by volume and 23 % by weight of the atmosphere.[27]

Oxygen is colorless, odorless and tasteless gas, also existing in the form of a light blue liquid. It is approximately 1.1 times heavier than air and slightly soluble in water and alcohol. At atmospheric pressure and temperatures below -183 c (-297 F), oxygen is a pale blue liquid slightly heavier than water. Oxygen reacts with most elements to form oxides. The diatomic gas is an essential compound in the production of fire[28]. Oxygen forms compounds with virtually all chemical elements except noble gases. [29]

Oxygen is very important for all living creatures. This fact makes oxygen as dangerous as makes it important. The two alarming levels in air are "too low" and "too high". The normal amount should be 21 %.[30]

a. When the Amount of Oxygen is too Low in the Air

You can survive, three weeks without food, three days without water / drinking, three minutes without air but only two breaths of air without oxygen.[31]

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[27] Ibid.
[28] Oxygen, www.uigi.com/oxygen.html.
[29] The term noble and inert means that the gases have extremely weak tendency to react with other compounds.
[30] Encyclopedia Britannica, vol. 9, p. 35.

If the level of oxygen contents in the air falls to zero, human beings will lose consciousness, in a second, without warning signals (pain, dizziness, etc.). If you survive then risk of brain damage is high.

b. When the Amount of Oxygen Exceeds in the Air

Excess of oxygen in the air is also very dangerous regarding the increase of the combustibility of materials. More than 21 % of oxygen helps materials to burn better and faster. An increase of just 3 % from the ambient oxygen concentration of 21 % doubles the combustion velocity.[32]

c. Applications of Oxygen Gas[33]

There are some applications of oxygen in various sectors like:

i. In the Steel Industry

The largest user of oxygen gas is the steel industry. Modern steel making relies heavily on the use of oxygen. During the steel making process, unwanted carbon combines with oxygen to form carbon oxides which exhales some gases. Oxygen is fed into the steel bath through a special lance. Large quantities of oxygen are also used to make other metals, such as copper, lead, and zinc.

ii. Welding and Cutting

Oxygen is used with fuel gases for welding, gas cutting, oxygen scarfing, flame cleaning, flame hardening, and flame straightening. In cutting the oxygen must be of high quality to ensure a high cutting speed and a clean cut.

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[31] Mnrao, p. 43.
[32] Oxygen, www.uigi.com/oxygen.html.
[33] Ibid.

iii. For Medical Purposes

In medicine, oxygen is used for surgery, intensive care treatment and inhalation therapy, etc. High standards of purity and handling must be maintained for administration of oxygen.

iv. Waste Treatment

In the biological treatment of waste water, the use of oxygen instead of air permits to increase capacity in existing treatment plants. Injection oxygen into sewers hydrogen sulfide formation, which results in reduced corrosion and odour.

v. In the chemical Industry

Oxygen is also used in chemical industry as a raw material in many oxidation processes, including the manufacture of ethylene oxide, etc.

vi. Others Use of Oxygen

Apart from the above uses of oxygen it has many other too e.g. uses in breathing apparatus and wood pulp manufacturing and also for smelting processes in mineral wool, and lime and cement kilns, etc.[34]

3. Argon (Ar.)

Argon is a monatomic, colourless, odourless, tasteless and non-toxic gas. Argon constitutes 1.3 % of the atmosphere by weight and 0.94 % by volume and found occluded in rocks.[35]Argon with helium, neon, krypton, xenon and radon constitutes a special group of gases known as the "rare, noble or inert gases". This gas is approximately 1.4 times as heavy as air and is slightly

[34]Oxygen, www.uigi.com/oxygen.html.
[35] The New Encyclopedia Britannica, Encyclopedia Britannica, Inc. Vol. 1, p.545.

soluble in water. Air is the only known source for the production of pure argon. Argon is present the most commonly among the rare gases.[36]

a. Applications of Argon Gas[37]

Argon gas is inert gas but it is used for different purposes which are as under:

i. For Lighting Purposes

Argon is used as a filler gas in incandescent light bulbs, where it reduces the evaporation rate of the tungsten filament thereby permitting the use of high filament temperature.

ii. In the Steel Industry

When steel is made in a converter, oxygen and argon are blown into the molten metal. The addition of argon reduces chromium losses and the desired carbon content is achieved at a lower temperature.

iii. For Cutting and Welding Purposes

Argon gas is also used in Plasma-arc cutting. Plasma-arc cutting has two applications where argon and hydrogen, provided a very high temperature when used with a special torch. And also argon or various argon mixtures are used as shield gases in many metal for arc welding methods.

iv. Shield Gas

Argon gas is also used as shield gas when inert properties of argon make it a good shield for protection against the oxidizing effect of air in the metallurgical industry and for welding.

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[36] Argon, www.uigi.com/oxygen.html.
[37] Ibid.

C. Sources of Air Pollution

Air pollution is one of the major issues of the environmental law. There are many sources which produce the pollution by different means. Industrial and transport sectors are main sources of air pollution. There are some major sources that pollute the environment and cause damage to human health, animals, plants and trees.

The figure shows sources of air pollution by classification of sources.

Classification of Sources of Air Pollution[38]

Total Sources

Stationary Sources	Mobile Sources
a. Industries.	a. Motor Vehicles
b. Power Plants.	i. Light Transport Vehicle.
c. Solid Waste.	ii. Medium Transport Vehicle
d. Medical Waste.	iii. Heavy Transport Vehicle.
e. Odour.	b. Port Vessels.
f. Residential etc	c. Air Crafts etc.

Figure: 1.1

There are many sources of air pollution but only some of them are being discussed here under:

1. Industrial Sector
2. Transport sector
3. Municipal solid waste and medical waste

[38] Mnrao, p. 12.

4. Smoke
5. Smog
6. Odour

1. Industrial Sector

Industrial sector is one of the major sources that contribute to air pollution. There are number of industries which are responsible for air pollution. Electrical power plants, petroleum refineries, petrochemical plants, cement factories, fertilizer factories and iron steel industries emit particulate matter, sulphur oxides, nitrogen oxides, hydrocarbons and carbon dioxides.

The particulate matters born by industrial toxic air pollutants are the chemical, metal and paper industries. These are also called stationary sources of air pollution.

Large quantities of air pollutant are also being emitted by industrial units such as power plants according to their fuel consumption. Power plants use the diesel and furnace oil which produce the specific particulate matter (SPM), NO_x, and SO_2 along with other parameters. As industrial sector has expanded, factories are emitting more and m ore toxic effluents into the air.

In recent years, there has been increasing concern about emissions from thermal power generation plants. Independent power producers started operations in Pakistan in the early 1990s and thermal power generation now accounts for 65 % of total power generation in the country.[39] Thermal power generation is also a major source of emissions worldwide, particularly when power plants operate on furnace oil or coal as opposed to natural gas, which is comparatively a clean fuel. In 1999, 44 % of thermal power generation in Pakistan is based on natural gas while

[39] Pakistan Energy Yearbook,1999.

54 % is based on crude oil with gas reserves depleting fast. There is danger that crude oil will continue to replace gas as the major fuel for power generation, thereby adding to emissions.[40]

Small and medium industries located within and around cities are also important in the contribution of emissions for air pollution, as leather tanneries, cutlery, light engineering and electrical goods, sports, surgical, petroleum refining and fertilizer industry concentrated in deferent cities of Pakistan, these also cause damage to human population and other property.

2. Transport Sector

Emissions from vehicles are also considered to be a major source of air pollution. Road transport sector causes more urban air pollution than any other single human activity. Transport and energy sectors contribute nearly one half of the NO_x, two thirds of CO and about one half of hydrocarbon emissions in the industrialized countries.[41]

It has been noted in the last two decades that air pollution from vehicles exceeds the maximum limits by various organizations including WHO, US-EPA, World Bank and ADB. Two stroke engine vehicles constitute nearly half of the total vehicular population in the South Asian cities, contribute significantly to urban air pollution in terms of noise, fine particulates SPM, PM_{10}, & $PM_{2.5}$, unburnt HC, Lead (Pb), CO, SO_2, No_x, O_3 and soot etc.

Incorporating vehicle age, maintenance, lubricant and fuel quality, two stroke engines are polluter in order of magnitude than their counter part four stroke engines of the same size. Two

[40] The National View of Air Pollution, http://www.rrcp.org/issues/air/maledec/baseline/Baseline/Pakistan/pakch1.htm, (last visited, 28.4.2006)

[41] TORs for project on air pollution Monitoring issued by ENERCON, part of project on fuel Efficiency in Road Transport Sector, 1998.

stroke engines are typically power efficient than four stroke engines.[42]When petrol is burnt in cars and trucks which release large quantities of sulphur dioxide, oxides of nitrogen, carbon monoxide, lead and suspended particulate matter. Lead used in petrol to protect engines is also dangerous. Diesel powered cars produce large quantities of particulates in form of black soot.

During the last few years, traffic in urban areas has increased tremendously due to increase in purchasing power and loan facility. There are an estimated 5.4 million vehicles on road in Pakistan and growth rate of this vehicular population has projected to be about 11 % per annum. Maximum growth has been seen in 2-stroke vehicles which were 1751 % and motorcycles 541 % and rickshaws 159%. Diesel trucks and buses are also increasing at on alarming rate of 200-300 since 1980. Diesel vehicles due to overloading, faulty injection nozzles and weak engines emit excessive graphitic carbon.[43]

Pakistani vehicles emit 25 times as much carbon dioxide as an average U.S. vehicle, as well as 20 times as many hydrocarbons and more than 3.5 times as many nitrous oxides in grams per Kilometer.[44]Pakistan per capita carbon emissions in 2001 were 0.2 metric tons per person and it is almost double compared to Bangladesh's 0.1 metric tons per person. Mostly Pakistan's carbon dioxide emissions were from oil at 54.6% while emissions from natural gas were at 38.1% and emissions from coal accounted for the rest at 7.2 %.[45]

Poor fuel quality is also to be blamed for the country's serious air pollution problems. Fuel consumption is increased by 65% in Pakistan from 1990-2003 and gasoline continues to contain

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[42]Qadir, Dr. Noman Fazal, *Air Quality Management in Pakistani Cities: Trends and Challenge,*
www.cse.polyu.edu.hk/activi/BAQ2002/BAQ2002_files/proceedings/subworkshop1/sw1a-4Qadir_paper.pdf (last visited 28-04-06).
[43] Abedullah, http://www.dawn.com/2005/05/09/ebr16.htm.
[44] The National Conservation Strategy Report, 1992.
[45] Abedullah , http://www.dawn.com/2005/05/09/ebr16.htm.

high level of lead and sulphur. Unleaded gasoline was introduced in 2001, but many vehicles in Pakistan's major cities still use leaded gasoline. Various grades of gasoline sold contain about 350 mg/liter of lead in comparison, leaded gasoline in other countries usually contains no more than 150 mg/liter.

The World Bank estimates in reports that air pollution causes 168,000 premature deaths annually in Pakistan, 60 % of them attributed to indoor air pollution and 132,000 premature deaths in Bangladesh, 70% form indoor air pollution[46] and 60% in India, accounts for 6% of the environmental health burden in India. It reveals that 10,000 people may die prematurely with more than 100,000 cases of respiratory diseases are linked with air pollution mainly by vehicular emissions in India in a year.[47]

3. Municipal Solid Waste and Medical Waste

Every person throws out his daily quota of newspapers, garbage, cans, bottles and other waste. The municipal solid waste includes sewage, waste from abattoirs human extra and plastic bags are another source of environmental pollution. Wilson defines solid waste as all activities of animals, including humans resulting in residential materials which are not of immediate use where they originate, and which are released into the three receiving media, namely air, water and land, as waste.

When solid waste is burnt, heavy metals like lead, gases, and soot are spread over residential areas. Rubbish, dust and gases found during the decomposition of waste, all contribute to air pollution.

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[46] World Bank's report for South Asia.

[47] Anad, Processing of Workshop on "*Integrated Approach to Vehicular Pollution Control in Delhi*", Central Pollution Control Board, New Delhi, 1998 p. 110.

Presently, there is no city in Pakistan with properly planned and efficient integrated municipal solid waste management system incorporating the acceptable standard of environmental protection and health. In most of the cities solid waste especially plastic bags get into open drains and severely choke the system. It is not possible for public agencies to make use of latest techniques, technologies and equipment being used in the developed world to mitigate air pollution.

Municipal bodies lack resources to remove the entire solid waste resulting in poor sanitary conditions especially in low income areas. These result in creating health hazards to public including air pollution & water contamination, increase in rodent, insects and bacteria.[48]

Pakistan generates over 50,000 tons of solid waste per day, out of which only 20% to 25 % is collected but even that too is not disposed off in the proper manner which is causing serious air, water and land pollution and health hazards. This implies that pollution level will further increase in coming years, if strict measures are not taken.[49]

Burning medical waste includes waste blood, tissue, organs and other parts of the human and animal bodies is also a serious source of air pollution, particularly in cities. Most incinerators are rudimentary by today's standards. They burn waste incompletely, releasing acidic gases, heavy metals and dioxins into the air, thus converting visible solid waste into much more dangerous and unmanageable invisible gaseous waste.[50]

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[48] Qadir, www.adp.org/documents/Events/2002/RETA5937/Manila/downloads/tp_16B_Qadir.PDF.

[49] Abedullah, http://www.dawn.com/2005/05/09/ebr16.htm.

[50] Air pollution Fact Sheet, http://www.wwfpak.org/factsheets_aps.php (last visited 28-04-06).

4. Smoke

Smoke particles are mainly unburnt carbon particles resulting from incomplete combustion. Carbon particles, which make smoke, are unburnt fuel. That's why smoking chimneys are indications of inefficiency in the process of converting fuel into useful energy. In the field of air pollution smoke, particularly black smoke is considered to be public enemy. Smoke affects public health and causes property damage. Black smoke apart from being a public nuisance is an economic waste as it is due to incomplete combustion of fuel. Fact is that all fuel can be burnt smokeless and efficiently. Therefore, it is surprising that many chimneys emit black smoke.[51]

Sources of smoke are brick kilns, automobiles, domestic use of fire, heating plants, industrial power plants, railway engines, ships and refuse incineration. It is also due to oil burnt in diesel engines. Brick kilns where the fuel used is often high sulphur coal are acknowledged as a major source of air pollution in the suburbs. .

5. Smog

The term smog is broadly applied to atmospheric pollution conditions characterized by a significant reduction in visibility. When air pollution in urban areas reduces visibility, it is often called smog. There are different types of smog. Smoke pollution from industries is some times called industrial smog. The pollutants it contains are sulphur oxides and particulates.

[51] Mnrao, p. 189.

Photochemical smog is brownish orange haze formed by chemical reactions involving sunlight.[52]

Air pollution is also acknowledged to be a contributory factor in the increased incidence of smog in large cities in the winter season.

In recent years, smog level in the winter season has increased to an extent where air travel to and from cities in the country has been seriously disrupted. The effects of lead emissions on inner city residents are also considerable.

7. Odour

Odour is undoubtedly the most complex of air pollution problems. Odour is caused in many cases by very minute quantities of substances. The only good measuring device for odour is the human nose. The odour is unavoidable by the nose. People have mixed reactions with respect to offensiveness of odours. "Perfumes liked by some, may be disliked by others.

Odours are emitted by many industries through food processing and oil refineries, etc. Paper and rubber industries and tanneries are the major odour emitting industries. The foul smell may not cause direct damage. They are as much a nuisance as noise, dirt or corrosion.[53]

Hydrogen sulphide, carbon disulphide, mercaptans, products of decomposition of proteins, phenols and some petroleum hydrocarbons are the malodours which are very common.

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[52] Godish, p. 24.
[53] Ibid., 2o7.

Odour sources may be confined in space, like emission from ducts, drainage ditches, settling lagoons and also granted due to various human activities like, garbage dumps, sewage works and agriculture activities.

The primary effects of odour on people are nuisance and others effects may be nausea, insomnia and discomfort. In Pakistan, no proper measures have yet been taken regarding odour by the concerned authorities.[54]

D. IMPACTS OF AIR POLLUTION

Air pollution is one of the greatest evils of environment. It puts very bad impacts on life & environment because air pollution consists of substances present in the atmosphere in high levels that adversely affect the humans, animals, plants and trees, material and economy of the country. Air pollution can affect directly or indirectly not only on living beings but also on building material and structure also. Impacts of air pollution can be divided into four categories which are as follows:

1. Effects of air pollution on human life/ health
2. Effects of air pollution on animals
3. Effects of air pollution on plants and trees
4. Economic effects of air pollution

Each of the above categories is discussed below:

[54] Mnrao, p. 212.

1. Effects of Air Pollution on Human Life / Health

Air pollution is one of the most dangerous evils affecting human life and health. The air we breathe has not only life supporting properties but also life damaging properties. The air which we inhale has qualitative and quantitative balance that maintains the well being of a man. But when the balance is disturbed or polluted it may cause harm to the human health and the environment.

An average man breaths 22,000 times a day and takes 16 kg air every day. It has been estimated that a man can live for three weeks without food and three days without water / drinking but only for three minutes without air. It is not necessary that all the impurities which we inhale cause harm to the human health. It depends upon the chemical nature of the pollutants. Some of them may be harmful while others may not be due to their high/low percentage in air. [55]

The duration of exposure of the body to the polluted air is also an important fact. So, there are some prime factors which affect human health they are:

a. Nature of the pollutants
b. Concentration of the pollutants
c. Duration of exposure
d. State of health of the receptor
e. Age group of the receptor

Generally, the effects of air pollution among the children, women and old people are much higher than amongst the young. The effects of air pollution on human health are more during the winter season when pollution reaches alarming level.

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[55] Ibid., 43.

Normally effects of pollution are manifested in specific human organs. These may be direct pollutants that come in intimate contact with already the affected organ. Such as in the case of eye and respiratory irritation. Effects may be indirect for example; pollutants may enter into blood stream via the lungs or gastrointestinal system by respiration. The principal target organs/organ systems are the eyes, the respiratory[56] and cardiovascular[57] systems, getting infected in the form of respiratory disease like Chronic Bronchial asthma and infections.

There are some diseases which result due to air pollution they are: [58]

i) Eye irritation.

ii) Nose and throat irritation.

iii) Irritation of the respiratory tract.

iv) Gases like hydrogen sulphide, ammonia cause odour and nuisance even at low concentrations.

v) Increase in mortality rate and morbidity rate.

vi) A variety of particulates particularly pollens, imitate asthmatic attacks

vii) Chronic pulmonary diseases like bronchitis and asthma are aggravated by a high concentration of SO_2, NO_2, particulate matter and photochemical smog.

viii) Carbon monoxide combines with the haemoglobin in the blood and consequently increase stress on those suffering from cardiovascular and pulmonary diseases.

ix) Hydrogen fluoride disease of the bone, and matting of teeth

x) Carcinogenic agents cause cancer.

xi) Dust particles cause respiratory diseases. Diseases like asbestosis, etc.

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[56] Respiratory system is the responsible for gas exchange and therefore receives direct exposure to airborne contaminants.

[57] The system of human body including the heart, vessel and veins, associated with blood distribute and transmission of cellular nitrates.

[58] Mnrao, p.45.

xii) Certain heavy metals like lead may enter the body through the lungs and cause poisoning.

Apart from the effects mentioned above there are some specific pollutants that affect the human health which are: [59]

a. Sulphur Dioxide is an irritant gas which affects the mucous membranes when inhaled. Under certain conditions, some of the air born sulphur dioxide gas is oxidised to sulphur trioxide which is very strong irritant, much stronger than sulphur dioxide.

b. Carbon monoxide has a strong affinity for combining with the haemoglobin of the blood to form carbon haemoglobin. This reduces the ability of the haemoglobin to carry oxygen to the body tissues. Carbon monoxide also affects the central nervous system and is responsible for heart attacks and a high mortality rate.

c. Ozone (O_3) is a gas that has an irritant action in the respiratory tract, reaching much deeper into the lungs of human than the oxides of sulphur.

d. Nitrogen dioxide is known to cause occupational diseases like those affecting farmer, cooks and traffic policeman etc. It is estimated that eye and nasal irritation will be observed after exposure to these oxides.

e. Fluorides are present in air, range from those that are extremely irritant and corrosive.

f. Hydrogen sulphide is a foul smelling gas. It is well know for its rotten egg like odour. Exposure to hydrogen sulphur sulphide for short periods can result in fatigue of the sense of smell.

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[59] Ibid., 46-48.

g. Lead: The main source of lead in urban atmosphere is the automobiles. The effects of lead including gastrointestinal damage, liver and kidney damage, pregnancy complications and mental retardation.

h. Hydrocarbon vapours: some of hydrocarbon vapours is the atmosphere have health implications. They affect the human body primarily in the form of irritations. It is a major contributor to eye and respiratory irritation caused by photochemical smog.

2. Effects of Air Pollution on Animals

The effects of air pollution on animals have developed as a corollary to the influence of human health. Most of the information concerning the natural exposure of animal to air pollution is contained in the reports of some major disasters. Recently, considerable information has been reported from medical research laboratories which describe the results of experimental exposure of small animals to various air pollutants. Animal used for laboratory research work were mice, rabbits, rats, pigs and monkeys.

a. Effects on Farm Animals

The process by which farm animals get poisoned is totally different from that by which human being get poisoned by pollution.

There are two step processes for farm animals.[60]

i) Accumulation of the airborne contaminants in the vegetation and forage.

ii) Subsequent poisoning of the animals when they eat the contaminated vegetation.

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[60] Ibid., 58.

In case of farm animals, the danger obviously is not in inhaling the polluted air but in human the harmful substances are directly inhaled. The danger obviously is not in inhaling the polluted air but the ingestion of forage which has been contaminated with pollutants like fluorine from the air.

b. Effects on Pets

Air pollution is affecting pets and domestic animals in smog affected cities. Canine[61] patients are found to be suffering from bronchitis, asthma and lack of appetite. Most of dogs suffer from cough, nose and throat diseases due to increasing air pollution.

It is interested to note that the average life of pets in Japan is 7 to 8 years but in developing countries they enjoy a life span of 12 to 13 years.[62]

Radioactive fallout from nuclear bomb testing in the atmosphere results in ionising radiation which has biological effects. The effects of radiation on animals are qualitatively similar to those on human beings. The effects may be either acute radiation effect or delayed long term effects. Symptoms of acute radiation injury develop with in period of hours to weeks. Only fallout occurring close to the nuclear bombs test site can produce acute radiation effects because of the higher degree of radiation received by the animals.

The long term effects of air pollution on animals are:

i. Cancer

[61] Animals, who have strong four teeth, like dog etc.
[62] Mnrao, p. 59.

ii. Shortening of life span

iii. Genetic or mutation effect

These effects take several years or even generations in case of genetic changes for manifestation.

There are three pollutants responsible for causing damage to the animals namely fluorine, arsenic and lead. The sources of these pollutants are industries, dust and spraying.[63]

. **Fluorine**: Farm animals like cattle and sheep are most susceptible to fluorine toxicsis. Horses appear to be quite resistant to fluorine poisoning. However poultry is the most resistant to fluorine of all farm animals.

. **Arsenic**: Arsenic occurs as an impurity in many ores and in coal. It has been reported to cause poisoning of livestock near various industrial processes and smelters. Arsenic in dust or sprayed on plants can lead to poisoning of cattle.

. **Lead**: Contamination of lead takes place on account of various industrial sources such as smelters, coke ovens and other coal combustion processes. Lead is also present in dusts and sprays.

3. Effects of Air Pollution on Plants and Trees

Air pollution has long been known for having adverse effects on plants and trees. Injury to plants can be manifested as visible or subtle effects. Subtle effects are identifiable changes in the leaf structure which may include chlorophyll destruction, death of tissue and pigment formation.

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[63] Ibid., 57.

Visible symptoms may result from acute[64] or chronic[65] exposures. Acute injury occurs from brief exposures to elevate levels of a phototoxic pollutants with chlorophyll destruction is major symptoms. The subtle effects are identifiable changes in leaf structure which may include chlorophyll, destruction of plants, tissue death and pigment formation.

Injury to agricultural plants and forests has been reported near uncontrolled nonfessous metal smelters in many parts of the world. Significantly, plant injury also occurs in developing countries around industrial sources like coal, and oil fixed power plants, phosphate fertilizer mills and glass plants.[66]

In the beginning, it was only sulphur oxide that was considered a dangerous pollutant for plants and trees but now due to various pesticides and new industrial processes, other harmful pollutants are increasing tremendously.

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Some time, vegetation over 150 km away from the source of the pollutants has been found to be affected. Industrial pollution from smelters has caused complete destruction of vegetation in some cases.[67]

Economic damage caused to crops and plants have been estimated for which compensation amounting to thousands of dollars has been paid for damage done to the crops. In Pakistan, there are many effects of these pollutants on crops and vegetations which are damaged from these pollutants.

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[64] Acute injury occurs from several hours to elevated levels of phytonic pollutants.
[65] Chronic injury results from long term exposure to reactively low pollutants concentrations.
[66] Godish, p. 184.
[67] *Plants Response to Air Pollution*, edit, Yunns, Muhammad, Iqbal, Muhammad, (John wiley & Sons, New York, 1996), p. 196.

Most plants close their Stomata[68]at night and are therefore much more resistant at night than in the day time. But some plants like potatoes don't close their stomata at night. It is affected by these pollutants.

Many efforts and changes in operating practices have resulted significantly to reduce the many point sources. The use of tall stacks is more effective dilution of emissions from coal fired power plants. It decreases injury to vegetation in the vicinity of these sources but it adventurely contributes to the problem of long range transport and atmosphere deposition of strong acids and other pollutants.[69]

There are some major pollutants which affect the plants, trees, and crops' growth and the phenomenon of photosynthesis and reduce the amount of light reducing the leaves. [70]

a. Sulphur dioxide causes two types of injury on the leaves of plants and trees, acute and chronic injury which depending on the concentration and period of exposure.

b. Hydrogen Fluoride, Except few species of plants it is effective in causing lesion and interfering with photosynthesis in concentrations two or three degrees less than in the case of sulphur dioxide. With most species it is up to 10 times as effective as sulphur dioxide. However, recovery of plants from the fluoride effect is much slow than from sulphur dioxide.

c. Ozone, injury due to ozone is totally different from typical smog injury. The effects of ozone on plants are mild and severe doses.

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[68] This is system which is open in high light intensity; supply high relative humidity, adequate moisture to the roots of the plants and moderate temperature.
[69] Godish, p. 185.
[70] Mnrao, pp. 64, 65.

d. Nitric oxides, injury due to nitric oxides are brown margins and brown black spots on the leaves. Nitrogen oxides are important in photochemical reactions which cause smog.

e. Ethylene causes injury to leaves of sensitive plants. The effects of ethylene are epinasty[71], curling, chlorosis[72] and leaf abscission and growth retardation.

4. Economic effects of Air Pollution

Air pollution damage to property is very important economic aspect of pollution. This problem has been investigated in detail and successful attempts have been made to observe that air pollution damages in terms of economic impacts.

Air pollution damage to property covers a wide range e.g. corrosion of metals, soiling and eroding of building surfaces, fading of dyed materials, rubber cracking, spoiling or destruction of vegetation, effects on animal, interfere in production and services. Another important economic effect of air pollution is deterioration the works of art.[73]

Economic damages from urban air pollution are about $ 370 million and 6.4 million people are hospitalized annually due to illnesses. This cost is including in the expenditures on health, economic and production loss due to absentees in factories, offices and schools.[74]Pakistan

[71] Leaf epinasty is a downward curvature of the leaf due to higher rate of growth on the upper surface.
[72] Chlorosis is the loss or reduction of the green plant pigment. Chlorosis generally indicates a deficiency of some nutrient required by the plant.
[73] Mnro, p. 70.
[74] Abedullah, http://www.dawn.com/2005/05/09/ebr16.htm.

currently spends abut $ 17 million per year on pollution to clean up but it requires $ 84 million. We are losing about $ 1.8 billion per year due to environmental damages.[75]

Air pollutants cause damage to materials through abrasion,[76] deposition and removal, direct chemical attack and corrosion on vegetation and plants.[77]Various economic losses occur because of material damage due to air pollution. Air pollution damages materials chiefly by corrosion of metals. The prime air pollutant responsible for metallic corrosion is sulphur dioxide. In the presence of oxygen sulphur dioxide is slowly converted into sulphur trioxide which may react with the moisture in the air to form sulphur acid.[78]

So, air pollution effects on economy of the country by damaging building material, paints, rubber, leather, paper, vegetation, and other intangible loss on the art or historical monuments like Taj Mahal in Agra (India) and Shalimar Garden in Lahore (Pakistan). But these economic losses can not be expressed in the shape of money.

E. Major Air Pollutants & their Impacts[79]

i. Suspended Particular Matter: This is a mixture of the solid and liquid particles suspended in the air. Suspended particulates are seen as dust, smoke and haze which can cause breathing problem, especially for people who have chronic respiratory problems.

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[75] Report Ministry of Environment of Pakistan, January, 2000.
[76] Large sharp edged particles imbedded in fabric can accelerate.
[77] The atmospheric deterioration of iron metals is by an electrochemical process, i.e., corrosion.
[78] Mnro, p. 7.
[79] Air pollution Fact Sheet, http://www.wwfpak.org/factsheets_aps.php.

ii. Volatile Organic Compounds (VOCs)**:** VOCs include gasoline, paint solvents, and organic cleaning solutions. They evaporate and enter in the air as vapour and molecules resulting from the incomplete burning of fuels and wastes.

iii. Carbon Monoxide (CO): Source of CO is vehicle emissions. This is an invisible, odourless gas that is highly toxic. It interferes with the blood's ability to transport the oxygen. On low or high concentration damage the heart of the individuals or cause heart problems. At medium concentration, carbon monoxide causes headache and fatigue. As the concentration increases, reflex slow down and drowsiness occurs. At high level carbon monoxide causes death. CO is great risk for pregnant women, infants and those with heart or respiratory diseases.

iv. Nitrogen oxide (NO_x): Nitrogen oxides cause lung irritants that can lead to acute respiratory diseases in children. They may also cause over sensitivity to pollen and dust for people who are suffering from asthma.

v. Sulphur Oxides (SO_x): Sulphur Dioxides is converted into sulphuric acid in the atmosphere. It can be poisonous to human and animals. SOx irritates the respiratory tract, causing airways to close and interfering with the lung's functions. Children and elderly are sensitive by SOx as people suffering from asthma and emphysema.

vi. Lead: Lead is dangerous, even at low concentrations. Lead can cause reduced intelligence in children, brain damage and death. It accumulates in the body and damages body tissue.

vii. Fuel wood: Indoor air pollution is caused by the burning of fuel-wood and dung for cooking. It can cause suffocation.

CHAPTER 2

INTERNATIONAL AGREEMENTS SIGNED AND RATIFIED BY PAKISTAN

This chapter is divided into three parts:

i. Ozone Depletion

ii. Climate Change

iii. Air Pollution

A) Ozone Depletion

Human activities having a destructive effect on the global ozone layer,[1] a region of the atmosphere that shields the earth from Sun's harmful ultraviolet rays. Ozone layer is being damaged by the increasing use of industrial chemicals called chlorofluorocarbons (CFCs).[2] These compounds are used in refrigerators, air- conditioners and aerosol sprays etc. Ozone consists of three molecules of Oxygen (O_2) while Chlorine is a chemical by product of CFCs. CFCs are the main cause of ozone depletion but supersonic air-craft emission, NO_2 and NO_3 emission which results from the application of nitrogen based fertilizer also participate in ozone depletion but these are minor depleting compounds as compared to the CFCs.

Following convention and protocol apply to ozone layer.

1) VIENNA CONVENTION FOR THE PROTECTION OF THE OZONE LAYER, 1985

Convention was adopted in Vienna on 22 March, 1985 but brought in force on 22 September, 1988. The parties of this convention are 190 countries including the European Economic

[1] Ozone layer means the layer of atmospheric ozone above the planetary boundary layer.
[2] Compounds of Fluorine.

Community (EEC) by December, 2005[3]. The Secretary General of UN performs the function as depository of this convention and its related protocols. Pakistan accessioned the Convention on 18 December, 1992.

a). Purpose of the Convention:[4]

The purpose of the convention are as under:

1) To protect human health and environment from adverse effects[5] resulting/to result from human activities which modify/to modify the ozone layer.
2) To control human activities found to have adverse effects on ozone layer by adopting agreed measures.
3) To co-operate in scientific research and systematic observation.
4) To exchange information in the field of legal, scientific and technical.
5) To protect the ozone layer by controlling emissions of substances that depletes it.
6) To improve the understanding of atmospheric processes.

This convention consists of 21 articles with two annexes. Under this convention, the parties have general obligation to take appropriate measures for human health and environment from the adverse effects resulting from the human activities. It is also the obligation of parties that according to their means or sources of disposal and capabilities to co-operate for systematic observation[6], research, and exchange of information for better understanding and assesses the

[3] Status of parties, www.iisd.ca/vol.19/enb1942e.html (last visited 30-07-04).
[4] Article 2, Vienna Convention for the Protection of the Ozone Layer, 1985. (Hereinafter called Convention on Ozone Layer, 1985). or See Hunter, David, & Salman, James, & Zaelke, Durwood. *International Environmental Law and Policy Treaty Supplement*, (New York Foundation Press, 1998), p. 60. (Hereinafter Hunter & Salman, 1998).
[5] Adverse effects means changes in the physical environment including changes in climate, which have significant deleterious effects on human health or on the composition, resilience, and productivity of natural and managed ecosystems, or on materials useful to mankind.
[6] Article 3, Convention on Ozone Layer, 1985.

effects of human activities (i) on the ozone layer, (ii) on human health and (iii) environment from the modification of the ozone layer.

Under the convention, the parties shall take to initiate directly or indirectly for research and scientific assessment on:

a) the physical and chemical process which affect the ozone layer;
b) the human health and other biological effects[7] which result from modification of the ozone layer;
c) climate effects from modification of ozone layer by ultraviolet radiation(UV-B);
d) those effects which driving from modification of the ozone layer and any change in UV-B radiation on natural and synthetic material which is useful for mankind;
e) substances, practices, processes and activities that may affect the ozone layer and their cumulative effects;
f) alternative substances[8] and technology
g) Socio-economic matters.[9]

In the convention, the parties shall facilitate and exchange the information in the fields of legal, scientific, socio-economic and commercial related to this convention. Under the convention, the parties shall also co-operate for national laws, regulations and practices to the developing countries need. This co-operation shall be carried out through:

a) acquisition of alternative technologies by other parties;
b) information about alternative technology, equipment and special manuals or guides;

[7] Which result from the changes in ultra-violet radiation.
[8] Means substances which reduce, eliminate, or avoid adverse effects on the ozone layer.
[9] Article 3, Convention on Ozone Layer, 1985.

c) Proper training of scientific and technical personnel.[10]

This convention also provides the mechanisms for dispute settlement[11] for the parties if any arise. A party declares in writing that dispute is not resolved by negotiation, or through good offices or mediation of the third party. It will accept one or both of the following means: i) Arbitration in accordance with the procedures adopted by Conference of Parties (COP) or ii) submission to International Court of Justice (ICJ). If parties have not accepted any said procedure, then dispute shall be submitted to a conciliation commission created by the parties. The recommendation of the commission shall consider in good faith by the parties.

If any party wants to withdrawal from the convention, the party shall be give written notice to the depository; the notice shall be affective after the four years from the date on which this convention has entered into force for the party. Withdrawal shall be effective upon the expiry of one year after the date of its receipt by the depository or such later date which is mentioned in the notification of withdrawal. This withdrawal shall be considered as also withdrawal from protocol related to this convention.[12]

Annex I of the convention describes the important issues for scientific research and systematic observation of the ozone layer.

Annex II of the convention describes legal, scientific, socio-economic, commercial and technical information shared/exchange with the parties of this convention.

[10] Article 4, Ibid.
[11] Article 11, Ibid.
[12] Article 19, Ibid.

2) MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER, 1987

This protocol is related to Vienna convention, 1985. This protocol was signed on September 16, 1987 but entered into force on January 01, 1989. Pakistan signed it on December 18, 1992. The parties of the protocol are 189 countries till July 18, 2006[13]. No signatory without ratification.

a) Purpose of the Protocol

Following are the main purposes of Protocol:

i) To protect the ozone layer by taking measures which eliminate the global emission of ozone depleting substances (ODS). These ODSs on the basis of developments in scientific knowledge, technical and economic consideration for the need of developing countries.

ii) To adopt precautionary measures for controlling emissions of certain chlorofluorocarbons have already been taken at national and regional level.

b) Commitments

The parties of the protocol are committed as:

a) to adopt control measures to reduce production and consumption of specific substances;[14]

b) control of trade with non parties;[15]

c) regularly scheduled assessment and review of control measures;

d) reporting of data;

e) co-operate in research, development, public awareness and exchange of information to the party;[16]

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[13] Status of parties, www.iisd.ca/vol.19/enb1942e.html.
[14] Article 2c Montreal Protocol on substances that Deplete the Ozone Layer, 1987. (Hereinafter Protocol on Ozone Layer 1987). or See Hunter & Salman, 1998, p. 72.
[15] Article 4, Ibid.

f) Establishment of financial mechanism and transfer of technology to assist the developing countries which are party to it.

If a developing country is unable to comply with control measures due to lack of fund and technical assistance provided in the protocol. She will notify it the ozone secretariat and the parties. The countries cannot consider invoking non-compliance procedure will be provided with funds and technical assistance. Meeting of the Parties (MOP) will decided by a balanced voting procedure.[17]

Under the protocol, each party shall ensure that consumption of controlled substances do not exceed 80% from the level of 1986 annually.[18]

The Montreal Protocol has established three panels of experts which are as under:

• **The Scientific Assessment Panel**: This is composed of government experts and others. This panel review scientific knowledge in a timely manner as dictated by the needs of the parties.

• **Technology and Economic assessment Panel**: This is composed of many industrial and non-governmental representatives. It analyse and evaluates technical options for limiting the use of ODS and also estimate the quantity of controlled substances, costs of technical solutions and issues of technology transfer required by the developing countries.

• **Environmental Effects Assessment Panel**: It surveys the impact on health and environment of altered levels due to increase in UV-B reaching on earth surface.

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[16] Article 9, Ibid.
[17] *Year book of Internal Co-operation on Environment and Development*, edit, Stokke, Olav Schram & Thommessen, Oystein B., (Earth Scan Publications Ltd. London, 2001), p. 95.
[18] Article 2, Protocol on Ozone Layer, 1987.

In 1990, 1992, 1997 and 1999 convention was amended and following is the brief note on that amendment.

i). LONDON AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER, 1990

The amendment was adopted in second meeting of parties in London on June 29, 1990 but came into force on August 10, 1992. Pakistan acceded to the amendment on December 18, 1992. Parties of the amendment are 183 countries including European Community till July 18, 2006[19].

In London amendment, 12 new chemical control substances were added and list of 34 new chemical transitional substances with reporting requirements. In the amendment there were also added some provisions relating to technology transfer and establish a financial mechanism that included the establishment of an Interim Multilateral Fund (IMF) to assist eligible parties to comply with control measures. Annual consumption of developing countries is more than 0.3 kg per capita of chlorofluorocarbons (CFCs) and more than 0.2 kg per capita of halons[20] also contribute to the IMF.[21]

Parties agreed on measures relating to substances that deplete the ozone layer involve the phase out of a specific list of CFCs, halons and tetrachloride by the year, 2000 and also the phase out of methyl chloroform by 2005, with scheduled interim reduction for each of the said classes of chemicals. London amendment also stipulates the reduction of consumption and production of CFCs by 50% in 1995, by 85% in 1997 and 100% in 2000.[22]

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[19] Status of parties, www.iisd.ca/vol.19/enb1942e.html.
[20] Article 2B, London Amendment to The Montreal Protocol On Substances That Deplete The Ozone Layer, 1990. (Hereinafter called London Amendment, 1990). or See Hunter & Salman, 1998, p. 80.
[21] Stokke, p. 90.
[22] Article 2A, London Amendment, 1990.

ii). COPENHAGEN AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER, 1992.

The amendment was adopted in the fourth meeting of parties in Copenhagen on November 23, 1992 but came into force on June 14, 1994. Pakistan ratified the amendment on February 17, 1995. Parties of the amendment are 174 countries including European Economic Community till July 18, 2006[23].

Copenhagen amendment phase out the dates for many ODSs include hydrochlorofluorocarbons (HCFCs), hydrobromofluorocarbon (HBCFs), and methyl bromide on the list of controlled substances[24] and confirmed financial arrangements for supporting the Multilateral Fund.

In Copenhagen amendment, to bring forward the phase out of CFCs and carbon tetrachloride and methyl chloroform by four or more years. First time parties agreed to bring methyl bromide a substance used for fumigation of soil, cut flowers, fruits, storage, and structure under the protocol.

New commitments also stipulate in Copenhagen amendment that industrialized countries should phase out as under:[25]

i) Halons by January 1994 instead of January 2000;[26]

ii) HCFCs, a less damaging transitional substitute for CFCS, by 2030.[27]

In the beginning of 1990, the parties will assess the control measures at least every four years provided for in the protocol on the basis of available scientific, environmental, technical, and

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[23] Status of parties, www.iisd.ca/vol.19/enb1942e.html.
[24] Means a substances listed in Annex A to this protocol, whether existing alone or in mixture.
[25] Stokke, p. 93.
[26] Article 2b, Annex I of Copenhagen Amendment The Montreal Protocol On Substances That Deplete The Ozone Layer,1992. or See Hunter & Salman, 1998, p. 92.
[27] Article 2a, Annex II. Ibid.

economic information. Such assessments have so far been completed in 1989, 1991, 1994, and 1998.

iii). MONTREAL AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER, 1997

Montreal amendment adopted in Montreal on September 17, 1997 but came into force on November 10, 1999. Pakistan ratified Montreal amendment on September 02, 2005. Parties are 146 couutries till July 18, 2006[28].

Montreal amendment added inter alia bans the import of methyl bromide and the export the ODSs for the countries which do not comply with the production control under the Montreal. Also the establishment of world wide licensing system introduced which is effective in 2000, to track the import and export of ODS and prevent smuggling and illegal traffic of ODS.[29]

This amendment put a ban on the export and import of methyl bromide to non parties from the commencing of one year after the date of coming into force of Montreal Amendment. A new article 4A was introduced which provides that any party still producing ozone depleting substances after the phase out to ban the export of recycled and reclaimed substances. Article 4B was also introduced in the amendment which provides that licensing system will be effective from January 1, 2000 and each party shall establish and implement a system for licensing the import and export of new recycled and reclaimed substances.

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[28] Status of parties, www.iisd.ca/vol.19/enb1942e.html.
[29] Stokke, p. 91.

iv). BEIJING AMENDMENT TO THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER, 1999

Beijing amendment was adopted in the eleventh meeting of the parties in Beijing on December 3, 1999 but came into force on February 02, 2002. Pakistan ratified the amendment on September 2, 2005. Parties are 141 till July 18, 2006[30].

The amendment include bromochloromethane for imitate phase out. This is also introduced production controls on HCFCs and controls on trade with non-parties and production controls and controls of trade with non-parties for HCFCS.[31]

a) IMPLEMENTATION OF CONVENTION AND PROTOCOL

Each party to the convention submits the report to Secretariat after two years about measures taken in the various categories of scientific research and co-operation. This report is reviewed and discussed in the COP. These reports are publicly available. The COP of the convention decided that in 1993 that party would have fulfilled its reporting obligations under the convention or under the Montreal Protocol. The compliance with obligations under the Montreal Protocol are measured by specific reporting requirements. General compliance is mentioned with the consultation of the parties, secretariat and by deliberation of annual MOP.

B) CLIMATE CHANGE

Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.[32]

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[30] Status of parties, www.iisd.ca/vol.19/enb1942e.html.
[31] Stokke, p. 91.
32 Article 1(2),). United Nation Framework Convention on Climate Change, 1992(UNFCCC, 1992). or See Hunter & Salman, 1998, p. 117.

3). UNITED NATION FRAMEWORK CONVENTION ON CLIMATE CHANGE, 1992(UNFCCC)

This convention concluded on May 09, 1992 at New York but came into force on March 21, 1994. Pakistan signed UNFCCC on June 13, 1992 but ratified on June 01, 1994. Parties of the convention are 193 countries including European Economic Community till May 04, 2004.[33]

This convention consists of 26 articles and two annexes. UNFCCC protects the climate changes by the human activities which substantially increase the atmospheric concentration of green house gasses (GHGs).[34]

a). Purpose of the UNFCCC[35]

There are some purposes of the convention which are as under:

i. To stabilize GHGs concentrations in the atmosphere at a level which prevent dangerous anthropogenic interference with the climate system.[36]With a time frame sufficient to allow ecosystems to adapt naturally to climate change;

ii. To ensure that food production is not threatened;

iii. For enabling economic development to proceed in the sustainable manner.

b). Commitments[37]

The parties of UFCCC have agreed as under:

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[33] Status of Parties, www.un.org/news/presi/docs/2005/envdev874.doc.htm (30-07-06).
[34] Means those gaseous constituents of the atmosphere, both natural anthropogenic that absorb and re-emit infrared radiation.
[35] Article 2, UFCCC, 1992.
[36] Means the totality of the atmosphere, hydrosphere, biosphere, and their interactions.
[37] Article 4, UNFCCC, 1992.

i) To develop, publish periodically update and make available to the COP national inventories of emissions and removals by sinks[38] of all GHGs which are not controlled by Montreal Protocol.

ii) To publish, formulate, implement, and regularly update national and regional programme containing measures to mitigate climate change by emissions, sinks, and reservoir GHGs.

iii) To facilitate for adequate adaptation to climate change.

iv) To promote and co-operate in the development, application and diffusion of technologies, practices and that processes which control, reduce or prevent GHG emissions.

v) To promote sustainable management, co-operate in the conservation and enhancement of all sinks and reservoirs of GHGs.

vi) To promote and co-operate in scientific, technical, socio-economic, research, systematic observation and development of data related to the climate system.

The developed countries shall adopt national polices and take measures for mitigation of the climate change, by limiting their anthropogenic emissions of GHGs and protect and enhance their GHG sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking lead in modifying the anthropogenic emissions consistent with the objective of the convention. These parties implement such policies and measures jointly with the other parties and every party should communicate within six month from convention came into force. Policies and measures and their projected anthropogenic emission sources and removals by sinks of GHGs, with the aim of returning these emissions individually or jointly to their 1990 levels.[39]

The developed countries of the convention shall provide new and additional financial resources to meet full agreed costs incurred by developing country parties in complying with their obligations

[38] Means any process, activity, or mechanism which removes a GHG or a precursor of a green house gas is stored.
[39] Article 4b, UNFCCC, 1992.

relating to the communication of information. Developed countries shall also provide such resources like transfer of technology for the requirement of developing countries to meet commitments under this convention.

Every developing country party to this convention shall make its initial communications within three years for that party or the availability of financial resources. Developing countries will effectively be able to implement their commitments under the convention which is depend on the financial resources, transfer of technology and take full into account that economic and social development and poverty eradication are the first priority of the developing countries.

4). KYOTO PROTOCOL TO THE UNITED NATION FRAMEWORK CONVENTION ON CLIMATE CHANGE, 1997

This protocol concluded in the third session of COP at Kyoto on December 11, 1997 but came into force in 2001. Pakistan became signatory to this protocol on January 11, 2005. Parties of the protocol are 156 countries including European Economic Community till November 25, 2005.[40]

a). Purpose of the Protocol

Purpose of the protocol is as under:

To further reduce GHG emissions by enhancing the national programmes by developed countries, aimed at this goal and by establishing percentage reduction targets for the developed countries.

The Kyoto Protocol contains individual emission limitations and reductions commitments for parties included in Annex I[41] to convention covering the six main GHGs. The range from 8% reduction for countries to a 10% increased by the period 2008-12. Overall these individual emission commitments will result in a reduction of 5.2% emissions of the six GHGs from 1990

[40] Status of Parties, www.un.org/news/presi/docs/2005/envdcv874.doc.htm
[41] Annex I of convention mentioned the developed countries.

levels of Annex I parties. Reductions in three most gasses, CO_2, CH_4 and N_2O will be measured from base year 1990 but reductions in three industrial gasses HFCs, PFCs and sulphurhexafluoride(SF_6) can be measured from 1990 or 1995 baseline.[42]

If compared with expected emission levels from year 2000, the total reductions required by the protocol will actually be about 10%, this is because of many industrialized countries have not exceeded in meeting their earlier non binding aim of returning their emissions to 1990 levels by the year 2000 and in fact, their emissions have risen since 1990. Compared with the emissions levels would be expected by 2010 without controlling measures but protocol gave target approximately at 30% reduction.[43]

There are some main provisions of the protocol which are as under:[44]

i). Parties shall individually or jointly ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the GHGs do not exceed their assigned amount, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and the provisions of Article 3, to reduce their overall emissions of such gasses by at least 5% below 1990 levels in the commitment period 2008-12.[45] The 5.2% reduction in total developed conntry emissions will be realized through national reduction as mentioned in schedule.

ii). Every party including Annex I shall make demonstrable progress for achieving its commitments by 2005.

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[42] Article 3, Kyoto Protocol to the United Nation Framework Convention on Climate Change, 1997. or See Hunter & Salman, 1998, p. 132.
[43] Stokke, p. 84.
[44] Ibid, p. 86.
[45] Article 3, Kyoto Protocol,1997.

iii). The net changes in GHG emissions by sources and removals by sinks resulting from direct human induced land and forestry activities since 1990. The GHG emissions by sources and removals by sinks associated with those activities shall be reported through verifiable mauner and also reviewed under Articles 7 and 8.

iv). Before the first session of COP to protocol, every party shall provide consideration by the Subsidiary Body for Scientific and Technological Advice(SBSTA)[46], data to establish its level of carbon stock in 1990 and to enable an estimate to be made of its changes in carbon stocks in subsequent years.

v). If the emissions of a party in a commitment period are less than its assigned amount, this difference shall be added to the assigned amount for that party for subsequent commitment periods.

vi). every party shall strive to implement the commitments such a way as to minimize adverse social, environmental and economic impacts on developing country parties. In the first MOP to the Protocol shall consider that actions are necessary to minimize the adverse effects of climate change and impacts of response measures on parties.

vii). Any emission reduction uuits, or any part of an assigned amount which party acquire from other part under the Article 6 or 7 shall be added to the assigned amount for the acquiring party. Any certified emission reduction acquired from anotber party under Article 12 shall be added to the assigned amount for the acquiring party.

Kyoto Protocol encourages governments to pursue emissions reductions by improving energy efficiency, reforming the energy and transportation sectors, protecting forests and other carbon

[46] Article 15, Kyoto Protocol, 1997.

sinks and also promoting renewable forms of energy, phasing out inappropriate fiscal measures and market imperfections. It is limit methane from waste management and energy systems. It also creates new incentives for technological creativity and the adoption of 'no-regrets' solutions that make economic and environmental sense irrespective of climate change.[47]

c). IMPLEMENTATION OF CONVENTION AND PROTOCOL

The COP shall keep regular review of the implementation of the convention and any related protocol to the convention that the COP may adopt and shall make the decisions necessary to promote the effective implementation of the convention.

i) Periodically examine the obligations of the parties.[48]

ii) Promote and facilitate the exchange of information on polices, strategies and measures adopted by the parties to address climate change.

iii) Promote and guide the development and periodic refinements of comparable methodologies.

iv) Assess the implementation of the convention by the parties that overall effects of the measures taken pursuant to the convention in environmental, economic, and social effects.

v) Consider and adopt regular reports on the implementation of the convention and ensure their publication.

National communications should describe the parties' efforts to implement the convention and quantify present and projected emissions.

[47] Stokke, p. 86.
[48] Article 4.2b and 12, UNFCCC.

5). STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPs), 2001

This convention was concluded at Stockholm on May 23, 2001 but entered into force on May 17, 2004. Pakistan became a party to this convention on December 6, 2001. Parties of this convention are 150 signatories including Pakistan and 117 countries ratified but Pakistan still did not ratify.[49]

a). Purposes of the Convention[50]

The main purposes of the parties to the convention are as under:

i. To protect human health and the environment from POPs.

ii. To adopt precautionary measures for better environment and its development.

This convention consists on 30 articles and 6 annexes. POPs Convention deals different chemicals like Aldrine and Dieldrin etc. which produce or increase the POPs. But related to our subject matter are only two gasses/chemicals which cause for POPs, which are mentioned in Annex C of this convention. These gasses/chemicals are Polychlorinated Dibenzo-p-Dioxins (PCDD) and Dibenzofurans (PCDF).[51] These are compounds that share certain similar chemical structures and biological characteristics. Dioxins and furans are unwanted by product of unintentionally human activities like power plants, burning of hospital and municipal waste and open burning of garbage and industrial processes. These gases or POPs also formed unintentionally and released from thermal process involving organic matter and chlorine as a result of incomplete combustion or chemical reactions. Dioxins and furans released into air during combustion which can be carried

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[49] www.unep.org (last visited 30-07-06).

[50] Article 1, Stockholm Convention on Persistent Organic Pollutants (POPs), 2001. Or see stokhe, p. 118.

[51] These chemical are tricyclic, aromatic compounds formed by two benzene rings connected by two oxygen atoms in PCDD and by one oxygen atom and one carbon-carbon bond in PCDF and the hydrogen atoms of which may be replaced by up to eight chlorine atoms.

long distance before settling to the earth's surface. These falling to land from air emissions tend to bind tightly to vegetation and soil.

The toxicity of PCDD and PCDF is expressed using the concept of toxic equivalency which measures the relative dioxin, like toxic activity of different congeners of PCDD and PCDF. The toxic equivalent factors values to be used for the purpose of this convention shall be consistent with accepted International Standards. The Concentrations are expressed in toxic equivalents.[52]

b). COMMITMENTS

The parties are committed to reduce and eliminate releases of POPs from unintentionally production of the each of the chemical mentioned in Annex C of this convention, like PCDD and PCDF.[53] This convention provides measures to reduce or eliminate releases of these POPs from stockpiles and waste[54].

Under the convention, parties are required to promote best available techniques and practices for replacing existing POPs while preventing the development of new POPs. Stockholm Convention calls for substitution involving the use of safer chemicals and processes to prevent unintentionally produced POPs. The convention also provides the procedure and criteria to add new POPs in the convention. Precaution is operationalised by the convention.

The convention also provides technical assistance for and between the parties to the convention. Parties shall take into account for the needs of developing countries and counties with economies

[52] Annex C, part IV, POPs, 2001.
[53] Article 5, Ibid.
[54] Article 6, Ibid.

in transition. Convention provides financial, technical assistance to the parties of developing countries including training regulating chemicals and reduction of these chemicals.[55]

Developed countries provide new and additional financial resources and mechanism which shall be helpful for developing countries to meet their obligations under the convention. This convention also provide provision, inter alia, for information exchange, implementation of plans, awareness and education, research, development for monitoring the countries regarding the fulfillment of their obligation under this convention.[56]

c). Implementation

Every party of the convention shall comply as under:

i) Develop and to implement a plan for the implementation of its obligation under this convention.[57]

ii) Transmit its implementation plan to COP within two years from the date on which this convention came into force.

iii) Review and update of implementation plan on a periodic basis and in a manner to be specified by the decision of the COP.

iv) If appropriate then parties shall co-operate directly or through global, regional, sub regional organization and consult their stakeholders in order to facilitate the development, implementation, and updating of their implementation plans.

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[55] Articles 12 and 13, Ibid.
[56] Articles 9-11, Ibid.
[57] Article 7, Ibid.

v) Every party shall report to the COP on the measures which have taken to implement the provisions of the convention and effectiveness of such measures in meeting the objectives of the convention.[58]

The COP shall develop and approve the procedures and institutional mechanisms for determining non-compliance and for treatment of the parties found to be in non-compliance.[59]

C. AIR POLLUTION[60]

Long range transboundary air pollution means air pollution whose physical origin is situated wholly or in part within the area under the national jurisdiction of one State and which has adverse effects in the area under the jurisdiction of another State at such a distance that is not generally possible to distinguish the contribution of individual emission sources or group of sources.[61]

Sources of transboundary air pollution are the sulphur dioxides (SO_2), nitrogen oxides (NO_x), particulate matter (PM) and Ammonia (NH_3) which produced by the combustion of fossil fuels for power generation, industrial use, and increasing volume of vehicle exhaust emissions. SO_2 and NO_x emitted in the atmosphere like volcanoes but these emissions represent only small proportion of the global total.[62]

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[58] Article 16, Ibid.
[59] Article 17, Ibid.
[60] See Chapter One for detail.
[61] Article 1(b), Convention on Long-Rang Transboundary Air Pollution, 1979.
[62] Birnie, P.W., Boyle, A.E. *International Law and the Environment,* second edition, (Oxford University press), p. 500.

6). MALE DECLARATION ON CONTROL AND PREVENTION OF AIR POLLUTION AND ITS LIKELY TRANSBOUNDARY EFFECTS FOR SOUTH ASIA, 1998

Male Declaration was approved in the seventh meeting of Governing Council of South Asia Co-operative Environment Programme (SACEP) which was held in Male (Maldives) on April 22, 1998 by the all South Asian Countries.

This declaration was approved as a result of process started by joint initiation of United Nation Environment Programmes (UNEP)/Environment Assessment Programme for Asia and Pacific (EPA-AP) based at Asian Institute of Technology (AIT), Bangkok. Representatives of South Asian Governments including Pakistan, India, Bangladesh, Nepal, Srilanka, Bhutan and Maldives met for a policy dialogue meeting in AIT, Bangkok on March 20, 1998. They agreed on principle that to a draft South Asian Declaration on control and prevention of air pollution. This meeting was organized by UNEP/EAP-AP base at AIT and Stockholm Environment Institute (SEI), Stockholm. This was funded by the Swedish International Development Co-operation (SIDA) and managed by SEI.

The draft of declaration was put before the South Asian environmental ministers for official declaration at the seventh meeting of the Governing Council of SACEP held in Male on April 22, 1998. This Governing Council meeting was inaugurated by President of the Republic of Maldives and attended by Ministers and high level policy makers from South Asian Environment Ministries. This meeting resulted in the approval of the Declaration on control and Prevention of Air pollution by the South Asian Countries.[63]

a). Purpose of the Declaration

There are some purposes of declaration which are as follows:

[63] Male Declaration, www.rrcap.unep.org/issues/air/maledec/baseline/indexpak.html (last visited 28-07-2006).

i) To achieve intergovernmental co-operation to address the increasing transboundary air pollution and consequential impacts on human health, ecosystem function and corrosion of materials due to concentration of pollutant gasses and acid deposition.

ii) To prevent the air pollution from the neighboring countries.

iii) Lay down the general principles of intergovernmental cooperation for abatement.

iv) To develop and implement national and regional action plans and protocols which based on the understanding of transboundary air pollution issues.

c). Commitments

South Asian countries are committed under Male Declaration as under:[64]

i) Assess and analyze the origin and causes, nature, extent and effects of local and regional air pollution, using in the house, identified institutions, universities, colleges etc., and building up or enhancing capacities in them where required.

ii) Develop or adopt strategies to prevent and minimize air pollution.

iii) Work in co-operation with each other to set up monitoring arrangements beginning with the study of sulphur, nitrogen and volatile organic compounds emissions, concentrations and deposition.

iv) Co-operate in building up standardized methodologies to monitor phenomena like acid depositions and analyse their impacts without prejudice to the national activities in such fields.

v) Take up above the said programmes that involve transfer of financial resources and technology and work towards securing incremental assistance from bilateral and multilateral sources.

vi) Encourage economic analysis that will help for achieving optimal results.

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[64] Ibid.

vii) Engage other key stakeholders like industry, academic institutions, NGOs, communities and media etc. in the effort and activities.

viii) To improve national reporting systems and strengthen scientific and academic effort in the understanding and controlling the issues of air pollution.

ix) To develop and implement national and regional action plans and protocols which are beneficial for understanding the issues of transboundary air pollution.

x) To take or adopt necessary step for the above said programmes and institutional structures at the national level, including networking policy, technical requirements and also use the good offices of regional , international bilateral and multilateral agencies.

c). Implications of Male Declaration

Implications are divided into two terms i) Short term implications and ii) Long term implications.

i) Short Term Implications

The short term implications are:

a. Evolving of the institutional structure at national level for policy and technical requirements;

b. Strengthening of monitoring arrangements;

c. Baseline studies to assess and analyze the air pollution issue; and

d. Development or adoption of national action plans.

ii) Long Term Implications

The long term implications are:

a. To protect the atmospheric environment in South Asia in the coming years;

b. To serve one or one more bridge between different political systems and factors of some stability in the time of political change; and

c. To create the essential frame work for controlling and reducing the damage to human health and the environment caused by localized and transboundary air pollution.

An action plan has also been agreed by south Asian Countries. Above said activities will also be implemented in three levels; i) national ii) sub-regional and iii) regional level. The baseline studies and national action plan, network researchers and policy makers will also be established at the national level. Activities of national and sub-regional levels will be aggregated by SACEP. Dissemination of tools, methodology and data will be done at regional resource centers.

d) Implementation of Male Declaration

All these programmes will be implemented by United Nation Environment Programme/Environment Assessment Programme for Asia and Pacific with the collaboration of SEI, SACEP, and SIDA support.

Pakistan as signatory to this Declaration depicted its serious commitments to improving ambient air quality but not yet fulfilled the commitments under this declaration and very behind as compared to other South Asian countries. Pakistan Environmental Protection Agency conducted a baseline study and developed national action plan and has started work under this declaration near city Bahawalpur. Environmental Protection Agency has divided these commitments into two phases. In first phase, putting and installing devices in city Bahawalpur to check how much emission comes from the neighboring countries including acid rain emissions. And Pakistan is on first stage which is now started by Pak EPA. In second phase, these emissions will controlled or prevented through adopting the controlling measures for transboundary air pollution.[65]

[65] Based on discussion with Dr. Zulfaqar H. Lodhi, Chief Chemist, Pak. EPA, Isb, who is dealing the Male Declaration, (dated 12-07-06).

CHAPTER 3

ENVIRONMENTAL LAWS ADDRESSING AIR POLLUTION IN PAKISTAN

The legal system of Pakistan and India has same origin. There are a lot of identical laws available in the both countries, but all of these laws were first legislated during British regime. The purely Pakistani laws were enacted during late 1950. Constitution of Pakistan empowered the National Assembly and Provincial Assemblies to make laws regarding environmental pollution.[1] The major activities of environmental legislation in Pakistan divided in different three phases.

- The first phase (1958 to 1965).
- The second phase (1970 to 1976).
- The third phase (1983 to 1997).

Now, I will explain environmental laws which address the air pollution.

A. THE PAKISTAN ENVIRONMENTAL PROTECTION ACT, 1997

The Pakistan Environmental Protection Act, 1997(Act, 1997) is the basic environmental law of Pakistan. The Act, 1997 was passed by National Assembly of Pakistan on 3rd September, 1997and by the Senate on the 7th November 1997 and received the assent of President of Pakistan on 3rd December 1997.

Now, it is the law of Pakistan. It is law of Pakistan regarding the matters of environment. The Act, 1997 extends to whole of Pakistan[2].There are provisions in this Act for establishing of two bodies, their composition and function. These are:

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[1] Article 142, item 24, Concurrent Legislative List, Constitution of Pakistan, 1973.
[2] Section 1(2), the Pakistan Environmental Protection Act, 1997.

Enforcing Bodies under the Act

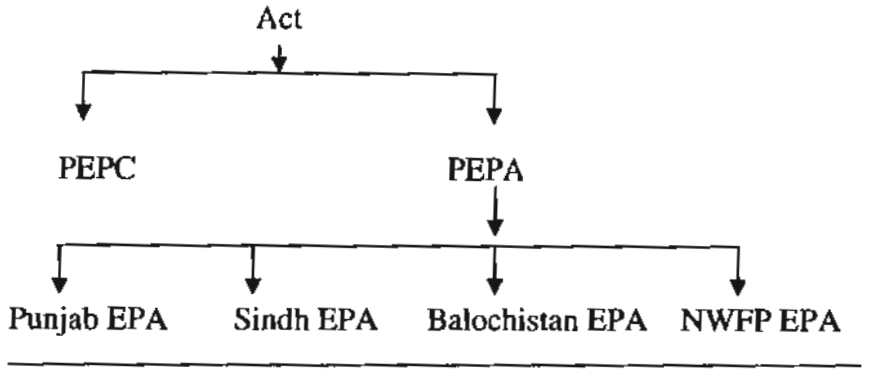

Figure: 3.1

. The Pakistan Environmental Protection Council. (PEPC)[3]

. The Pakistan Environmental Protection Agency (PEPA)[4]

. Provincial Agencies in every Province.[5]

The PEPC is headed by the Prime Minister of Pakistan. The functions of the PEPC include enforcement of Act, 1997 and to establish national environmental policies, to ensure the implementation and approved National Environmental Quality Standards.

The Pakistan Environmental Agency (PEPA) exists under the PEPC. It is headed by Director General. The DG may establish such advisory committees as he deems fit to assist him. The functions and power of agency are stipulated in sections 6 and 7 of the Act, 1997.

The Government of Pakistan is bound to protect the environment in accordance with its international commitments under various conventions and treaties signed and ratified by it.

[3] Sections 3 and 4, Ibid.
[4] Sections 5 to 7, Ibid.
[5] Section 8, Ibid.

Pakistan pollution protection programme can be divided into existing activities and prospective activities. The Act, 1997 deals with both types of the activities under it provisions.

There are certain provisions regarding air pollution in the Act, 1997 which are as follows:

> ***Regulation of motor vehicles.***[6] (1) Subject to the provision of this Act and the rules and regulations made there under, no person shall operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the National Quality Standards, or where applicable the standards established under clause (g) of sub section (1) of section 6.
>
> (2) For ensuring compliance with the standards mentioned in sub section (1), the Federal Agency may direct that any motor vehicle or class of vehicles shall install such pollution control devices or other equipment or use fuels or undergo such maintenance or testing as may be prescribed.
>
> (3) Where a direction has been issued by the Federal Agency under sub section (2) in respect of any motor vehicles or class of motor vehicles, no person shall operate any such vehicle till such direction has been complied with.

This provision provides rules and regulations regarding motor vehicles. Under this act, no person shall operate any motor vehicle that produce or cause air pollution or noise pollution and are emitting combustion that exceed the concentration of National Environmental Quality Standards (NEQS) or that standard which are mentioned by the Provincial Government under clause (g) of section 6(1) of the Act.

Under this clause Provincial Governments have a power to specify the standards regarding:

- Standards for discharge or emission from different sources or specify any conditions.

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[6] Section 15. Ibid.

. Where standards are less stringent than NEQS prior approval of the council shall be obtained

. Some areas where approval of the council excludes from carrying out specific activities.

There are NEQS for industrial and transport sectors that are in tables 3.1 and 3.2.

NEQS Standards for Motor Vehicles[7]

S.NO	Parameter	Standard (Max. Permissible limit)
1	Smoke	40% or 2 on the Ringlemann Scale during engine acceleration mode
2	Carbon	Emission Standards New Used 4.5% 6%

Table: 3.1

[7] NEQS, Annex-II, Revised NEQS dated 08th August, 2000.

NEQS Standards for Industrial Sector[8]

S.NO	Parameter	Source of Emission	Existing Standards	Revised Standards
1	Smoke(2)	Smoke capacity not to exceed	40% or 2 Ranglemann Scale	40% or 2 Rangleman n Scale or equivalent smoke number
2	Particulate Matter(2)	a) Oil fired, Coal fire and Cement Kilns b) Grinding, Crushing etc	300 500 200 500	300 500 300 500
3	Hydrogen Chloride(2)	Any	400	400
4	Hydrogen Fluoride(2)	Any	150	150
5	Sulphur Oxides(2)	Sulphuric acid/suphonic acid plants	400 400	5000 1700
6	Lead(2)	Any	50	50
7	Cupper(2)	Any	50	50
8	Zinc(2)	Any	200	200
9	Nitrogen Oxides(4)	Nitric acid manufacturing unit, gas fired, oil fired, Coal fired	400 400	3000 400 600 1200

Table: .3.2

Federal Agency will ensure the compliance with the level of these NEQS which may direct that any motor vehicle or class of motor vehicle shall install such pollution control devices or equipment or use fuel maintenance testing as may be prescribed. Federal Agency issued any directions under sub section of the above section regarding motor vehicles or class of motor

[8] NEQS, Annex-III, Ibid.

vehicles, no person shall operate any such vehicle until the fulfilment or compliance with order or directions issued by the Federal Agency.

If contravention of this provision occurs than it is punishable by Provincial or Federal Agency with fine which may extend to one hundred thousand rupees (Rs.1,00,000) and if continuing contravention or failure then additional fine which shall extend to one thousand rupees (Rs.1000) for every day[9].

Enforcement of the Act

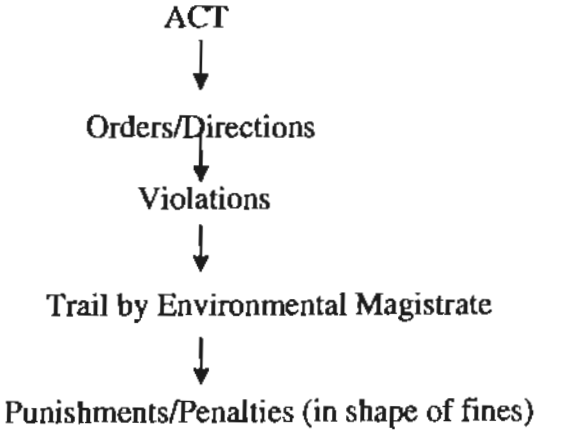

Figure: 3.2

All contravention or orders or directions or failures are trailable by Judicial Magistrate of 1st class as environmental Magistrate especially empowered by High Court of Province.[10]

> ***Environmental protection order***:[11] (1) Where the Federal Agency or a Provincial Agency is satisfied that the discharge or omission of any effluent, waste, or the handling of hazardous substances, or any other act or omission is likely to occur, or is occurring or has occurred in violation of the provisions of this Act, rules or regulations or of the conditions of a licence, and is likely to cause or is causing or has caused an adverse environmental effect, the Federal Agency or as the case may be, the Provincial Agency may, after giving the person responsible for such discharge emission, disposal, handling, act or omission an opportunity of being heard, by order directed such person to take such measures that the

[9] Section 17(2), Act , 1997.
[10] Section 24(1), Ibid.
[11] Section 16, Ibid.

Federal Agency or Provincial Agency may consider necessary within such period as may be specified in the order.

(2) In particular and without prejudice to the generality of the foregoing power, such measures may include:

(a) Immediate stoppage, preventing, lessening or controlling the discharge. Emission, disposal, handling, act or omission, or to minimize or remedy the adverse environmental effect:

(b) installation, replacement or alteration of any equipment or thing to eliminate or control or abate on a permanent or temporary basis, such discharge, emission, disposal, handling, act or omission:

(c) action to remove or otherwise dispose of the effluent, waste, air pollution, noise, or hazardous substances: and

(d) action to restore the environment to the condition existing prior to such discharge, disposal, handling, act or omission, or as close to such condition as may be reasonable in the circumstances, to the satisfaction of the Federal Agency or, Provincial Agency

(3) Where the person, to whom directions under sub section (1) are given, does not comply therewith, the Federal Agency or Provincial Agency may, in addition to the proceeding initiated against him under this Act or the rules and regulations, itself take or cause to be taken such measures specified in the orders as it may deems necessary, and may recover the costs of taking such measures from such person as arrears of land revenue.

Under this section, The Federal Agency or Provincial Agency as the case may be has a power to direct a person responsible for environmental pollution. After being heard, to take specified measures like immediate stoppage, prevent or direction to install or replace and alteration of any equipment, which is cause to reduce or abate the pollution. Also Agencies have power to take action for removing or deposed off those substances which are causing the air pollution.

Under the section where person directed to make the above said changes but he fails or contravenes the provision, the agencies have a power to take action against and pass an order against that person. Cost may be recovered as arrears of land revenue[12]. And shall be punishable with fine which may extend to one million rupees(Rs.10,00,000) and in case of continuing

contravention or failure, with additional fine which may extend to one hundred thousand rupees(Rs.1,00,000) for every day.[13]

B. THE PUNJAB LOCAL GOVERNMENT ORDINANCE, 2001

The other relevant law for air pollution is the Punjab Local Government Ordinance, 2001(Ordinance, 2001) which extends to the whole of Province of the Punjab except the Cantonment areas. It came into force on August 14, 2001.[14] A large number of functions are performed by local institutions and the most important among them is public health. The public health is very old concept of environmental laws and it is also given sufficient weight in the Ordinance, 2001. It is the duty of Local Government or institutions to look after the sewerage and drainage system and also protect the environment from different pollutants within their jurisdiction. The Bazaars and streets have to be swept clean. Water is to be sprinkled with a view to lessen the nuisance and air from the dust and dirt. There are certain provisions to deal environmental matters in the Punjab local Government Ordinance, 2001. It is the duty of Local Institutions to beautify the public places like public ways, roadsides, plantation, parks and public buildings.[15] Under the directions of the Provincial Government, Local government shall take all steps regarding the matters of environmental pollution prepare and implement schemes for air pollution and water under this Ordinance.

There are some provisions regarding air pollution which are as under:

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[12] Arrears of land revenue means land revenue which remains unpaid after the date on which it becomes payable.
[13] Section 17(1), PEPA, 1997.
[14] Section 1(3), the Punjab Local Government Ordinance, 2001.
[15] Section 51(A), Local Ordinance, 2001.

Offence:[16]An act or omission specified in the Fourth Schedule shall be an offence liable to punishment by way of imprisonment or penalty under this Ordinance.

Damaging or polluting physical environment, inside or outside private or public premises, in a manner to endanger public health.[17]

According to this provision of the Ordinance any act or omission would be considered an offence which damage the environment in public or private premises any danger the health of people. If any body violate the provision of the Ordinance, he shall be liable to punishment by way of imprisonment or penalty under this Ordinance.

General Powers of Local Government:[18] *(1)* Notwithstanding any specific provisions, every Local Government, the Village Council and Neighbourhood Council shall perform functions conferred by or under this Ordinance and in performance of such functions shall exercise such powers as are necessary and appropriate thereto

(2) Until different provisions, rules or bye laws are made, the respective Local Government shall exercise such powers as are specified in the Sixth Schedule.

This section says every Local Government, the Village Council and Neighbourhood Council shall perform such functions as are conferred by or under this Ordinance. While performing such functions they may exercise such powers that would be necessary and appropriate in this behalf. Respective Local Government shall exercise those powers that are mentioned in Sixth Schedule of this Ordinance and these powers may be continued till such time until other provisions, rules, or by laws are made in this behalf.

Environmental Pollution:[19] *(1)* The concerned Local Government may preparation and implementation of schemes for the prevention of the pollution of air by gases, dust or other substances exhausted or emitted by automobiles engines, factories, brick kilns, crushing machines for grain, stone, salt or other material and such other sources of air pollution as the bye-laws may provide.

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[16] Section 141, Ibid.
[17] Fourth Schedule, part iii, item 61, Ibid.
[18] Section 195, Ibid.
[19] Schedule Sixth, Item 48, Ibid.

This item of the Sixth Schedule prevent the air pollution by gases, dust, and other substances which are exhausted or emitted by automobile engines, factories, brick kiln and other sources. This is also responsibility of the Local Government to control and take measures regarding controlling and abating the air pollution and save the atmosphere for the better health of people as well as the property.

C. THE MOTOR VEHICLES ORDINANCE, 1965

The third relevant law regarding air pollution Motor Vehicles Ordinance, 1965 and it extends to the whole of Pakistan except the Tribal[20] areas.

The Motor Vehicles Ordinance, 1965 provides certain provisions which either directly or indirectly have some impacts on the environment. These provisions deal with licensing of drivers of motor vehicles, conductors and registration of motor vehicles. Specially these provisions regarding air, noise and visual pollution can be implemented and regulated under this ordinance.

The provision in Ordinance, 1965 related to air pollution is as under:

> Whoever contravenes any provision of this Ordinance or any rules made there under shall, if no other penalty is provided for the offence under this Ordinance, be punished with fine which may extend to one hundred rupees, and if having been previously convicted of such an offence, shall again be guilty of an offence punishable under this section, shall be punished for every such subsequent offence to fine which may extend to five hundred rupees.[21]

This section provides effective measures for offence where contravenes of any provision of this ordinance or any rules are made under this ordinance. If there is no other penalty/punishment available any other penalty/punishment in this ordinance or the committed offence, it shall be

[20] Section 1 (2), Ibid.
[21] Section 112, Ibid.

punished with fine that may extend to one hundred rupees (Rs.100) and if the same person already convicted for the same offence under this ordinance, he shall be punished for every such subsequent offence to fine that may extend to five hundred rupecs (Rs.500).

D. THE MOTOR VEHICLES RULES, 1969

The fourth relevant law is the Motor Vehicle Rules which are formulated under the authority of Motor Vehicles Ordinance, 1965. The rules which attract the matter of environment are discussed as under.

> ***Silencer:*** [22] (a) Every motor vehicle shall be fitted with the device (hereinafter referred to a silencer) which by means of an expansion chamber or otherwise reduces as for as may be reasonable and practicable the noise that would otherwise be made by the escape of exhaust gases from the engine.
>
> (b) Every motor vehicle shall be so constructed or equipped that the exhaust gases from the engine are not discharged downwards so as to impinge on the road surface.
>
> (c) Every motor cab rickshaw shall be equipped with a detachable double buffle plates silencer once the genuine silencer is rendered unserviceable. The detachable double buffle plate's silencer shall be of the specification given in the sixth schedule to these rules.

This rule deals with silencers of the vehicles which cause noise and air pollution. According to this rule, every motor vehicle shall be so constructed or equipped that the exhaust gases from engines are not discharged downwards so as to impinge on the road surface. Every motor cab rickshaw shall be equipped which is mentioned under Six Schedule under these rules.

> ***Emissions of smoke vapour of grease:***[23](1) Every motor shall be so constructed, shall be maintained in such condition, and shall be so driven and used that there shall not be emitted from any smoke visible vapour, grit, sparks, ashes, cinders, or oily substance the emission of which could be prevented or avoided by the taking of reasonable steps or the exercise of reasonable care or the emission of which might cause damage or annoyance to other persons or property or endanger the safety of any other users of the road.
>
> (2) Every motor vehicle using solid fuel shall be fitted with an efficient appliance for the purpose of preventing the emission of sparks or grit and also with a tray or shield to prevent ashes and cinders from falling on the road.

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[22] Rule 155, the Motor Vehicles Rules, 1969.
[23] Rule 163, Ibid.

This rule provides safeguard to control the discharge of smoke, vapour and grease in the atmosphere. This rule says that every motor vehicle shall be so constructed and shall be maintained in such conditions which shall not be emit things like smoke, visible vapour, grit, sparks, and ashes etc. Emission could be prevented or avoided by taking reasonable steps or exercise reasonable cares. This emission might cause damage and annoyance to other persons or property or endanger the safety of any other users of the road.

E. THE FACTORIES ACT, 1934

The fifth relevant law is The Factories Act, 1934 (Act, 1934) which extends to the whole of Pakistan.[24]It came into force on the 1st day of January, 1935.[25]

After revolution in industrial sector, a new area of safety engineering and public health has emerged in the name of safety. The Act, 1934 deals with the protection of workers health through controlling the work on environment to reduce or eliminate hazard, industrial accidents and unsafe working conditions which can cause temporary or permanent injury, illness or even death.

The Act, 1934 provides some measures to control and prevent such a situation, which are greatly attached to the safety and security to the workers. There are some provisions regarding control of the pollution and health and welfare of the workers.

> ***Dust and fume.***[26](1) In every factory in which by reason of the manufacturing process carried on, there is given off any dust or fume or other impurity of such a nature and to such an extent as is likely to be injurious or offensive to the workers employed therein, effective measures shall be taken to prevent its accumulation in any work room and its inhalation by workers, and if any exhaust appliance is necessary for this purpose, it shall be applied as near as possible to the point of origin of the dust, fume or other impurity, and such point shall be enclosed so far as possible.
>
> (2) In any factory no stationary internal combustion engine shall be operated unless the exhaust is conducted into open air and exhaust pipes are insulated to prevent scaling and radiation heat, and no internal combustion engine shall be operated in any room unless,

[24] Section 1(2), the Factories Act, 1934.
[25] Section 1 (3), Ibid.
[26] Section 16, Ibid.

effective measures have been taken to prevent, such accumulation of fumes therefrom as are likely to be injurious to the workers employed in the work room.

This provision provides safety measures regarding the suspension of dust particles and fumes available in the factory vicinity due to the nature of work. The law says every factory in which manufacturing process is carried on, there is given off any dust, fume or impurity of such a nature and to such an extent that is likely to be injurious or offensive to the workers. Effective measures shall be taken to prevent its accumulation in any workroom. It shall be applied as near as possible to the origin of the dust, fume or other impurity and that point shall be enclosed so far as possible.

According to this provision of law, in every factory, no stationary internal combustion engine shall be operated unless the exhaust is conducted into open air and also exhaust pipes are insulted to prevent scaling and heat.

Precautions against dangerous fumes.[27] (1) In any factory no person shall enter or be permitted to enter any chamber, tank, vat, pit, pipe, flue or other confined space in which dangerous fumes are likely to present to such an extent as to involve risk of persons being overcome thereby, unless it is provided with a manhole of adequate size or other effective means of ingress.

(2) No portable electric light of voltage exceeding 24 volts shall be permitted in any factory for use inside any confined space such as is referred to in sub section (1) and, where the fumes present are likely to be inflammable, a lamp or light other than of flame proof construction shall not be permitted to be used in such confined space.

(6) The Provincial Government may make rules prescribing the maximum dimensions of the manholes referred to in sub section (1) and may by order in writing, exempt, subject to such conditions as it my think fit to impose, any factory or class or description of factories from compliance with any of the provision of the this section.

The Act, 1934 provides extreme precautions against dangerous fumes. It provides that no person shall enter in a factory or be permitted to enter any chamber, tank, vat, pit, pipe, flue or other confined space in which dangerous fumes are likely to be present to such extent as involve risk of

[27]Section 33-K, Ibid.

persons being overcome. Unless it is provided with a manhole of proper size or effective means on ingress.

The Act says that suitable breathing apparatus, reviving apparatus and belts and ropes etc. shall be kept in every factory. It is also provided by law that a sufficient numbers of employees of a factory shall be trained and practised in the use of all such apparatus. The Provincial Government is given power to make rules prescribing the maximum dimensions of manhole refereed in sub section (1) of the Section 33- k.

> ***Explosive or inflammable dust, gas, etc.*** [28] (3) Where any part of the plant or machinery in factory contains any explosive or inflammable gas or vapour under pressure greater than atmospheric pressure, that part shall not be open except in accordance with the following provisions, namely:-
>
> (a) before the fastening of any joint of any pipe connected with the part of the fastening of the cover of any opening into the part is loosened, any flow of the gas or vapour into the part or any such pipe shall be effectively stopped by a stop valve or other means;
>
> (b) before any such fastening as aforesaid is removed all practicable measures shall be taken to reduce the pressure of the gas or vapour in the part or pipe to atmospheric pressure;
>
> (c) where any such any fastening as aforesaid has been loosened or removed, effective measures shall be taken to prevent any explosive or inflammable gas or vapour from entering the part or pipe until the fastening has been secured or as the case may be, securely replaced:
>
> Provided that the provisions of this sub section shall not apply in the case of plant or machinery installed in the open air.

The provision of the Act says that whenever any part of plant or machinery etc. which contains any explosive or inflammable gas or vapour under pressure is opened, the same shall be done with extreme care and in accordance to the provisions of as provided in the Act. Effective measures shall be taken to prevent explosive, inflammable gas or vapour.

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[28] Section 33-L, (3), Ibid.

Penalty for smoking or using naked light in vicinity of inflammable material:[29] Whoever smokes, or uses a naked light or causes or permits any such light to be used in the vicinity of any inflammable material in a factory shall be punishable with fine which may extend to five hundred rupees.

Exception: This provision does not extend to the use, in accordance with such precautions as may be prescribed, of a naked light in the course of a manufacturing process.

The provision of the Act provides the penalty for those persons who smoke or use naked light in the vicinity of any inflammable material in a factory, when the worker is working in the factory. That person shall be punishable under this section shall be punishable with fine which may extend to five hundred rupees (Rs. 500).

There is exception in the section that this section does not extend if take some precautionary measures and during the manufacturing process of naked light.

F. THE PAKISTAN PENAL CODE, 1860

The sixth relevant law about protection of the air pollution is The Pakistan Penal Code (PPC) which is applicable through out Pakistan. PPC is not to be considered as a body of ethics which punishes acts merely because those acts are immoral. Nor it may be assumed that because no punishment is provided for an act that is not immoral or innocent in as much as many acts which are not punished by the Penal Code are morally worse than many for which no punishment is provided therein. The criminal law is generally a part of public law and those acts are punished which generally tend to prejudice community for which punishment is to be inflicted by the State.

PPC deals different types of crimes which have its own punishments regarding nature of the crime. Some of these punishments are more strict or hard but some of them are minor or negligible which

[29] Section 66, Ibid.

are provided under this Code. PPC also have some provisions regarding environment which provides the punishment for violator of these provisions against individual or community at large.

As discussed above there are some provisions in PPC about environmental pollution but our relevant provision is as follows:

> ***Making atmosphere noxious to health.***[30] Whoever voluntarily vitiates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighbourhood or passing along a public way, shall be punished with fine which may extend to fifteen hundred rupees.

This provision provides the punishment to that person, who voluntarily pollutes the atmosphere and make it noxious to the health of people by carrying on any business in the neighbourhood or on public way. Public affected by his business or any other activities which produce bad smell or other contaminants in the atmosphere.

If any body violates this provision of law he shall be punished under this section with fine which may extend to fifteen hundred rupees (Rs.1500).

G. WEST PAKISTAN PROHIBITION OF SMOKING IN CINEMA HOUSES ORDINANCE, 1960

The seventh relevant law is West Pakistan Prohibition of Smoking in Cinema Houses Ordinance, 1960.This Ordinance made in 1960. It is extends to the whole of the province of West Pakistan except the Federal Capital and the Special Areas.

This Ordinance, 1960 protects the non-smokers from smoking and other tobacco uses in any building where exhibition of cinematographic films take place. This Ordinance covers only the smoking and other tobacco effects on the health during the performance or exhibition of film which cause different diseases like heart problems, breathing etc. This Ordinance prohibits the people from the smoking during performance or exhibition of any film.

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[30] Section 178, Pakistan Penal Code, 1860.

Relevant provision is as:

> ***Penalty for smoking in cinema houses.***[31] Whoever smokes, during any performance, demonstration or exhibition, in any part of a cinema house reserved for the audience or the spectators, shall be punished with fine which may extend to one hundred rupees.
>
> ***Explanation***- For the purpose of this section, a performance, demonstration or exhibition shall be deemed to commence when audience or the spectators have entered the cinema house to witness the performance, demonstration or exhibition therein and to continue until they have left the house after the final closing of the performance, demonstration or exhibition.

This provision provides the protection to non-smokers from the smoking or other uses of tobacco during the performance, demonstration or exhibition of film in cinema or any part of the cinema. This provision comes into operations when audience or spectators enter in the cinema house or coming in the cinema house until the final closing of performance or exhibition..

If any body breaches or violates the provision, he will be punished with fine which may extend to one hundred rupees (Rs.100).

H. PROHIBITION OF SMOKING AND PROTECTION OF NON-SMOKERS HEALTH ORDINANCE, 2002

The last but not the least relevant law for air pollution is Prohibition of Smoking and Protection of Non-Smokers Health Ordinance, 2002. This Ordinance made in 2002 but came into force in 2005. It extends to the whole of Pakistan. Smoking and other tobacco uses are posing a serious threat to the health of the people and the environment. It is expedient to provide for prohibition of smoking and other tobacco uses in public places, works or use in public vehicles. This Ordinance protects the health of non-smokers and matters connected with it.

It also prohibits the storage of smoking, advertising on media or in Public vehicle and also its not sale to less than 18 years children. This ordinance also gave the protection against the smoking

and other tobacco uses in less than 50 meters from the building of any educational institutions. And provides penalty against those contravene the provisions of the said Ordinance.

The relevant provisions are as under:

> ***Prohibition of smoking and others tobacco use:***[32] No person shall smoke or use tobacco in any other form in any place of public work or use. The Federal Government may, however, issue guidelines for permitting designated smoking areas in premises or places where adequate arrangements are made to protect the health of non-smokers.

This provision prohibits the person to smoke or use tobacco in any public places, work or use because smoking affects human health. The Federal Government has power to permit to smoke in those areas where non smokers are not affected by such smoking. Actually this section protects the health of the non smokers from the smoking and other tobacco uses.

If any body contravenes the provision, he shall be punished with fine that may extend to one thousand rupees (Rs.1000). If he repeats the same offence under this section then he shall be punished with fine which shall not be less than one thousand rupees (Rs.1000) and may be extend to one hundred thousand (100,000) rupees.[33]

> ***Prohibition of smoking in public service vehicles:***[34] Without prejudice to the provisions of the Provincial Motor Vehicle Ordinance, 1965, no person shall smoke or use tobacco in any other form in the public service vehicle.

This provision protects the non smokers from smoking in public service vehicles. Under the provision no person is permitted to smokes or use of tobacco in any form during the travel in public service vehicles because the health of non-smokers can not affected due to such smoking.

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[31] Section 3, West Pakistan Prohibition of Smoking in Cinema Houses Ordinance, 1960.
[32] Section 5, Prohibition of smoking and Protection of Non-smokers Health Ordinance, 2002.
[33] Section 11 (a), Ibid.
[34] Section 5, Ibid.

If any body violates the provision then he shall be punished with fine that may extend to one thousand rupees (Rs.1000) and continuing the same offence the punishment, which shall not be less than one thousand rupees (Rs.1000) and may be extend to one hundred thousand (100,000) rupees.[35]

> ***Prohibition on advertisement of cigarettes, etc:***[36] Notwithstanding any thing in any law for the time being in force, no per son or company shall advertise tobacco and tobacco products on media or in any place and any public service vehicle, if such advertisement is not in accordance with guidelines prescribed for this purpose by a committee which the Federal Government may, by notification in the Official Gazette, constitute.

Under this provision no person or company are advertise tobacco or other tobacco products on media, any public place or in any public service vehicle unless that person or company shall advertise it in accordance with the committee's guidelines provided for this purpose which is made by notification of Federal Government in the official gazette.

If any person or company contravenes the said provision he shall be punished with fine which may extend to five thousand rupees(Rs.5000) and second offence under this section will be punishable with imprisonment which may extend to three months and with fine which shall not be less than one hundred thousand rupees(Rs.1,00,000).[37]

> ***Prohibition of storage, sale and distribution of cigarettes, etc., in the immediate vicinity of educational institutions:***[38] No person shall himself or by any person on his behalf, store, sale or distribute or any other smoking substances or any other tobacco products with in 50 (fifty) meters from any college, school or educational institution.

This provision prohibits to store, sale and distribution of cigarettes or other smoking substances or other cigarettes products within 50 meters from any educational institution.

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[35] Section 11(a), Ibid.
[36] Section 7, Ibid.
[37] Section 11(b), Ibid.
[38] Section 9, Ibid.

If any person contravenes the said provision he shall be punished with fine which may extend to five thousand rupees(Rs.5000) and second offence under this section will be punishable with imprisonment which may extend to three months and with fine which shall not be less than one hundred thousand rupees(Rs.1,00,000).[39]

After discussing the above said laws on environment, especially on air pollution, it is concluded that these laws are sufficient but need to ensure the implementation of these laws and impose severe penalties to violators for the safety of the health or life of the people. There is also need to spread awareness among the general masses regarding laws to save the environment from the pollution for the safety of lives of human and of the other species. This awareness can be brought through media and other effective sources. Elite or rich class is safe because of living in good environment or safe residential areas but these problems are faced by the poor class who are living in crowded or over populated areas due to lack of facilities. So, there is need to implement the said laws properly for the protection of human beings from polluted environment.

[39] Section 11(b), Ibid.

CHAPTER 4

CASE LAW STUDY ON AIR POLLUTION

There are very few reported cases dealing with the matters of environmental pollution especially air pollution. But whatever cases have been decided by our superior judiciary is milestone in the way of legal control of environmental pollution. Presently, only handful cases are on the credit of the Supreme Court of Pakistan which may be quoted proudly as a contribution of legal fraternity as an effort for the control of environmental pollution like air pollution. Due to these judgements, not only the situation has been a bit improved but also a firm foundation has been provided for the further growth of environmental case law in Pakistan.

The First case is:

A. Shehla Zia vs. WAPDA[1]

Initiated in the Supreme Court as human rights case by a group of concerned citizens. This case was filed against WAPDA to stop construction of grid station near a residential area. The judgement in favour of citizens became a landmark decision in the field of environmental law and set precedent for future cases. This case sets two important principles (i) right to life enshrined in the constitution and (ii) the right to an unpolluted environment

This is a full bench judgement heard on 12th February 1994. The bench comprised the Chief Justice of Pakistan Mr. Justice Naseem Hassan Shah, Mr. Justice Saleem Akhtar and Mr. Justice Manzoor Hussain Sial. Supreme Court on receipt of a letter from four residents of street No. 35, F-6/1, Islamabad, alleged that Article 184 of the constitution could be invoked in the

[1] PLD 1994 SC 693.

circumstances of the case and after preliminary hearing notices were issued by the honourable apex court exercising its extraordinary jurisdiction.

The Honourable Supreme Court found that the letter raised two issues, (i) whether Government had a right to endanger the life of citizens by its actions without the latter's consent? And (ii) whether zoning laws vest rights in citizens which could not be withdrawn or altered without citizen's consent. The Supreme Court had widened the scope of Article 9 of the Constitution of Pakistan and adopting a view that the word "life" in the Constitution has not been used in a limited sense. Article 9 of the Constitution of Pakistan provides that no person shall be deprived of life or liberty save in accordance with law. The word 'life' as used in the said article has very broad and significant importance. In environmental jurisprudence, the world 'life' is a comprehensive term, and covers not only all the living things known as 'biotic factors'[2] but it also covers all the non living things 'abiotic factor' on which the existence of living organisms depend. While the judge has quoted the definition of the word 'life' as followed:

> "Life means that state of animals, humans and plants or of an organized being, in which its natural functions and motions are performed, or in which its organ are capable of performing their function; The interval between birth and death. The sun of the forces by which death is restricted.... 'life' protected by the federal Constitution include all personal rights and their enjoyment of the faculties, acquiring useful knowledge, the right to marry, establish a home and bring up children, freedom of worship, conscience, contract, occupation, speech, assembly and press."

For widening the scope of Article 9, the bench speaks in the following words:

> "the Constitutional law in America provides an extensive and wide meaning for the word 'life' which includes all such rights, which are necessary and essential for leading a free, proper, comfortable and clean life. The requirement of acquiring knowledge, to establish home, the freedom as contemplated by the constitution, the personal rights and to be protected to enjoyment are nothing but part of life. A person is protected to enjoy his personal rights, freedom and liberties. Any action taken which may create to enjoy the life according to law. In the present case this is the complaint the petitioner has made. In our view the word 'life' constitutionally is also wide that

[2] Factors relating to life or living things.

the danger and encroachment complained of would impinge fundamental rights of citizen."

The learned judges of the Supreme Court after analysis came to following conclusion:

> "The word 'life' in the constitution has not been used in limited manner. A wide meaning should be given to enable a man not only to sustain life but to enjoy it. Under our constitution, article 14 provides that the dignity of man and subject to law the privacy of home shall be inviolable; the fundamental right to preserve and protect the dignity of man under article 14 is unparalleled and could be found only in few constitutions of the World. The constitution guarantees dignity of man and also right to 'life' under Article 9 and if both are read together, question will arise whether a person can be said to have dignity line without proper food, clothing, shelter, education, health care, atmosphere and unpolluted atmosphere."

In this case not only the term 'life' has been given a new and wider meaning but also the effect of electromagnetic field produced by the flow of electricity and its effect on human life has been very technically and significantly dealt. The petitioners filed several research articles and reports against the installation of grid station in residential area. The notices were issued to CDA and WAPDA to file their comments.

The court observed as follows:

> "From the material produced on record which contains update studies and researches it seems that so far no define conclusion have been drawn by the scientist and scholars, but the trend is in support of the fact that here may be likelihood of adverse effect of electromagnetic fields on human health. It is for this reason that in all the developed countries special care is being taken to establish organizations for carrying on further, research on the subject. The studies are, therefore, no certain, but internationally there seem to be a consensus that the lurking danger which in an indefinite manner has been found in individual incident and studies can not be ignored."

The court strongly criticized and condemned WAPDA for not having proper research regarding present issue. It also observed that all the research material produced by the WAPDA is not fresh, it is twenty years or more old and not authenticated. WAPDA was directed to use better resources and employ qualified persons in their research team.

The matter of environmental protection is at a high priority in the observation of bench but in a case when there is no consistency between the material and evidence of the experts put before the court, court has to balance between inconvenience suffered by the general public and economic advantages of such a power project.

Although the petitioners were failed to get the relief as they sought but the apex court has given a verdict regarding the sufficient precautionary measures which the respondents were bound to follow in the interest of public welfare. The relevant portion of judgement is as follows:

> "In the problem at hand the likelihood of any hazard to life by magnetic field cannot be ignored. At the same time the need for construction grid stations which are necessary for industrial and economic development cannot be sight of"

In this judgement, the WAPDA is directed to take necessary steps for future installation of any grid stations in following words:

> "WAPDA is further directed that in future prior to installing or constructing any grid station and/or transmission line, they would issue public notice in newspapers, radio and television inviting objection and finalised the plan after considering the objection, if any, affording public hearing to the persons filing objections."

The environmentalists of Pakistan say that the case of Shehla Zia is important in respect to definition of 'life'. It is a great success because life has equipped them with a legal tool in their fight against pollution and polluters in future.

B. SUO-MOTO ACTION BY SUPREME COURT UPON NEWS ITEM CONCERNING ENVIRONMENT EXPLOITATION: TRAFFIC CONGESTION / NOISE POLLUTION[3]

Supreme Court of Pakistan took suo-moto action regarding the traffic congestion in the city of Karachi and resulting smoke and noise pollution. The court held that one cause of pollution is the

[3] Qadar, Dr. Sohaib & Dogar, Athar Rafique, *Pakistan's Environmental Laws and Their Compliance*, (Lahore Law Times Publications, 2003), p. 113.

adulteration in the fuel and directed to have a good check at all the levels at refinery, Oil Company, during transit and at the petrol pumps. The court ordered as follows:

> "As required by Motor Vehicle Ordinance the concerned authorities should ensure that the motorcycle rickshaw is not allowed to play without silencers. It has been pointed out that there has been a practice in Karachi that the silencers are not fitted in the motorcycle rickshaws. Such practices, however, cannot override the provisions of law; particularly rule 155 and 158 of the Motor Vehicle Rules, 1969." And

> "Many vehicles are found fitted with pressure horns or multi-tone horns giving unusually harsh shrill loud or alarming voice. Rule 154 of the Motor Vehicle Rules, 1969 prohibits fitting such horns; the practice seems to be that such vehicles are challaned and pressure horns are disconnected or seized by the police. However, in order to make it more effective whenever any authority seizes such horns; it should deposit it with Central Nizarat situated opposite Civic Canter, Karachi."

C. ABDUL LATIF and others. Vs. ADDITIONAL SESSIONS JUDGE, SAHIWAL and others.[4]

This case was heard on 29th January, 2001 by Mr. Justice Dr. Munir Ahmad Mughal. It was of shifting a factory from the residential area to abate the nuisance. Executive Magistrate exercised the powers under section 133, Cr.P.C. in his order, directed that leather factory owned by petitioner be shifted and that order was upheld in revision by Additional Session Judge hold that factory was causing nuisance to the inhabitants of the locality. In writ petition Lahore High Court declared that the orders passed by the Executive Magistrate and Additional Session Judge, Sahiwal was without jurisdiction, without lawful authority and of no legal effect. While commenting upon the superiority of Pakistan Environmental Protection Act, 1997 as a special law over other general laws, the petition was accepted and The Lahore High Court held that:

> "This Act is a complete code for; inter alia, prevention/elimination of any pollution amounting to public nuisance as visualized by section 133, Cr.P.C. This Act being of special status overrides the provisions of general statute i.e. Code of Criminal Procedure in respect of the matters covered by it. Section 133, Cr.P.C. by implication stands repealed and the impugned orders therefore could not be legally passed by the learned Executive Magistrate and

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[4] 2001 CLC 1139.

learned Additional Session Judge (respondents), the same are liable to be declared as without lawful authority."

In this case it was settled that there is separate law for environment that is Pakistan Environmental Protection Act, 1997. It came into force and act is prevailing over previous laws regarding environment. All environmental cases will decided under this Act.

D. ABDUL MANAN Vs. D.M QUETTA[5]

In these petitions, the petitioners had challenged the closure of their brick kiln in the court of District Magistrate Quetta, under section 144 Cr.P.C. The District Magistrate, Quetta and Environmental Protection Agency, Balochistan contested these petitions. Which were dismissed by the High Court of Balochistan. Thereafter, the Government compensated the Brick Kilns owners all the Brick Kilns were shifted out of Quetta Municipal Limits.

E. ROTARY CLUB QUETTA COSMOPOLITAN, through its CHARTER PRESIDENT Vs. D.M QUETTA and OTHERS[6]

This is public interest litigation, it was contended that brick kilns situated around Quetta city are causing air pollution. The emission of heavy smoke and injurious gases is hazardous to environment. Not only this but the heavy smoke near the Air Base causes vision problems and creates danger to the aircrafts at the time of taking off or landing. It was prayed that either the brick kilns be shifted out of the municipal limits or the owners be asked to use filtration and checking system. The petition was disposed off by order dated 23-12-1999 on the undertaking by the District Magistrate Quetta that action has been taken against the brick kilns and their operation has been banned under section 144 Cr.P.C.

[5] C.P NO.323-324/2004 and 329 to 351/2000.

After the petition was disposed off, the Balochistan Environmental Protection Agency took action and issued Order under sections 11 and 16 of the Act, 1997.[7] As a result of these orders, all the brick kilns situated within Quetta Municipal Limits have been shifted out and Government has paid compensation of rupees three lac and thirty thousand (Rs.3,30,000) to every brick kiln.[8]

F. SHAH JEHAN Vs. D.C. PISHIN[9]

This petition is also for public interest litigation. Shah Jehan resident of District Pishin wrote letter and pointed out the pollution problems by the grinding mills of tobacco in the municipal limits of Pishin. He prayed for shifting of grinding mills out of municipal city limits. The High Court of Balochistan passed a stay order against the construction and operation of the mills. On 19-03-2001 the High Court disposed the petition and allowed the owners to construct the mills, however, the authorities of the Municipal Committee Pishin and EPA Balochistan were directed to ensure that the construction of Grinding Mills is carried out in the manner that the air be safe from pollution.[10]

G. M/S ABDUL REHAN ENGINEERING WORKS Vs. ENVIRONMENTAL PROTECTION AGENCY, LAHORE[11]

The brief facts of the appeal are that Muhammad Safdar etc resident of street No. 2/3, Bilal Park Daroghawala, Lahore lodged a complaint against M/s Abdil Rehman Engineering Works before the Director General Environmental Agency, Lahore where it was alleged that one Abdul Rehman was intending to construct a workshop on his residential plot and was going to install the machine

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[6] C.P No. 119/99.
[7] Pakistan Environmental Protection Act, 1997.
[8] Qadar, p. 117.
[9] C.P No.851/99
[10] Qadar, p. 117.
[11] Appeal No. 02/2002, Environmental Protection Tribunal, Lahore.

therewith which would cause a pollution. A notice was issued to industrial unit complained against and on 03-11-1999 an Environmental Protection Order was passed under section 16 read with section 12[12] against the owner of said industrial unit was directed to shift his unit to some other suitable place outside the Municipal limits with in 60 days.

Aggrieved unit, hereinafter called appellant came up in appeal. On the other side, EPA instituted a complaint under section 12 of the Act, against the appellant. During the tendency of the matters, Muhammad Safdar and Malik Ahmad Sher, two of the original complainants moved an application under 1 rule 10 read with section 151[13] for being impleaded as a party in the appeal.

Learned counsel for the appellant contended that the impugned order dated 03-11-1999 was without jurisdiction because Agency had no power under the Act, 1997 to order the shifting of the unit in question from one place to another under section 16 of the said Act. It is an admitted fact that proceedings against the appellant was initiated on the sole ground that owner had not filed with the agency an Initial Environmental Examination/Environmental Impact Assessment under section 12 of said Act and thus in exercise of its powers under section 16, it had passed the impugned order.This provision clearly shows that the Agency was not invested with the powers to order the shifting of unit from one place to other.

Learned counsel for applicants unsuccessfully argued that such an order could be made but latter on gave it. Therefore, we have no hesitation in holding that agency did not have any power to order the shifting of unit from one place to other under section 16 of the Act and thus the impugned order was without jurisdiction null and void. As a result the appeal is accepted on this short ground and the impugned order is set-aside.

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[12]PEPA, 1997.
[13]Code of Civil Procedure, 1908.

Learned council for the applicants in C.M. No. 2/2001, maintained that the industrial unit was causing pollution and the department should be asked to take action against it. If any pollution is being caused by the said unit and the same is within the knowledge of the applicants they are advised to approach the agency with a formal complaint and it is hoped that agency shall take appropriate actions under the law.[14]

H. ENVIRONMENTAL PROTECTION TRIBUNAL, LAHORE[15]

This case was decided by the Environmental Protection Tribunal, Lahore. The part of the judgement is as follows:

> "District Officer Environment Kasur appoints commission to visit the respondent's power plant. He submitted the report that the management of the unit had acted upon the direction of Environmental Protection Order to extend of all most 60% which was indicated of the fact that the respondents had positive intention of mitigating the problem. He has further reported that the problem of noise and smoke emission resulting in noise and air pollution was still there. He recommended that a period of four months be given to the respondents for completion of the mitigation process. Learned counsel for respondents assures that the process will be completed in the prescribed time period."

The parties agreed that a direction be issued to the respondents for compliance of the direction contained in the report of the Commission, within four months, that the complaint may be disposed off with permission to get it restored if the aforementioned directions are not complied within the stipulated time.[16]

I. ANJUM TAJRAN Vs. CHARM[17]

Facts of the case that there are twenty five shops situated in Aminpur Bazaar of Faisalabad where hides and skins business is being carried out since long. In addition thereto many other persons who do not own shop have been running their business at this place in front of the shops and in the open market. Hides and skins are stored/kept inside and outside the shop. It is admitted

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[14] Qadar, p. 118.
[15] C.M. No. 1/2001.

position that this place is situated in a thickly populated area. The offensive smell is source of pollution and undoubtedly, it endangers human life.

By interim order the shop keepers/merchants dealing in hides and skins were restrained from keeping the hides and skins and other articles of this merchandise out side their shops and the footpath.

On 12-12-1996, Court directed the Superintendent of Police Faisalabad for himself visiting Chamra Mundi (Aminpur Bazaar) and challan the delinquent shopkeepers under the relevant law, who were found keeping hides and skins outside the shops and the footpath. The present position is that hides and skins business has been virtually shifted and the storage of the hides and skins is being made in Sialvi Colony which is adjacent to the existing slaughter house.

After hearing the learned counsels for the parties and learned Additional Advocate General, court observed that this is a fit case in which appropriate directions should be issued under Para (c) of clause (1) of Article 199 of the Constitution for enforcement of fundamental rights of the residents of the area to enjoy peaceful qualitative life.

This writ petition is disposed off with this needless to observe that functioning of the Municipal Corporation and the local Administration while complying with the above directions of the court. They shall not in any manner be influenced by any political or other consideration. The public interest is supreme. No one should yield to any extraneous consideration.

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[16] Qadar, p. 119.
[17] 1997 CLC 1281.

J. PAKISTAN CHEST FOUNDATION and others. Vs. GOVERNMENT of PAKISTAN and others.[18]

This writ petition heard on 4th March, 1997 by Mr. Justice Aqil Mirza. Petition was filed by Pakistan Chest Foundation (PCF), the Pakistan Anti-Tuberculosis Association and two others to seek following relief:

> "It is, therefore, respectfully prayed that it may kindly be declared that the broadcasting and telecasting of advertisements on Pakistan Radio Network and Pakistan Television promoting sale of cigarettes and sponsorship of programmes displaying commercials and banners by the cigarette companies are illegal and without lawful authority. The respondents Nos. 1 to 6 may kindly be further restrained from permitting of displaying commercials and banners by broadcasting and telecasting, as the case may be and arranging associating with the sponsored programmes of Pakistan Tobacco Company, respondent No. 7, on the PBC and PTV to promote sale of cigarettes."

Petition says that Pakistan Television (PTV) and Pakistan Broadcasting Corporation (PBC) is regularly advertising different brands of cigarettes for on behalf of the various tobacco companies through alluring commercials, to promote and increase the sale of cigarettes in the country. It is pleaded that cigarettes advertisements result in promoting cigarette smoking habit among the people of Pakistan, especially in younger generation. Smoking does not only spoil the health of the smokers themselves but it also adversely affects the health of the person who are made to passively smoke because they perforce inhale the smoke emitted by the smokers while sitting near them.

The writ petition was contested by PTV, PBC and various tobacco companies in Pakistan. They said that there is no law which prohibits advertisements of cigarettes on the electronic media, therefore, the same cannot be banned by the court in view of the provisions of Article 4 of constitution, which ordains that no person can be prevented or be hindered in doing that which is not prohibited by law.

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[18] 1997 CLC 1379.

The court accepted the writ petition in the support of short/interim order dated 21-03-1997 with following directions.

a) Pakistan Television Corporation shall not telecast from its television centres any cigarette related commercial nor shall it show any programme/advertisement which may have the effect of promoting/propagating cigarette smoking among the people. This restraint order shall become operative with effect from 01-04-1997, as the subsisting contracts shall expire 31-03-1997.

b) The restraint order contained in the preceding paragraph will, however, be not applicable for a period of three years i.e. till 31-03-2000, in respect of live telecasting of various sports events sponsored by the companies, provided the actual smoking is not shown therein and is followed by proper warning. To seek further extension in the aforesaid period of three years for sports live telecasting, the Pakistan Telecasting Corporation may approach this court with appropriate prayer, which will not be considered in the prevailing facts and circumstances.

c) The PBC shall not be relying upon any advertisement for the purpose of popularising smoke among the people. The commentaries of sports events without propagating smoking can, however, are relayed in view of the statement made by the learned counsel for PBC that in the commentaries the only thing said is that the programme is relayed with the cooperation of the particular cigarette company.

K. M.D. TAHIR Vs. WAPDA and others[19]

Petitioner is an advocate, he has sought a direction to respondents to plant trees in the country, to ban on the air-conditioners, refrigerators and deep freezers which according to him, causing environmental pollution.

Comments were submitted by respondents and stated that this is Provincial subject not that of the Federal Government. The air conditioners and refrigerators do not spread oxygen and nitrogen and that the Government has been encouraging maximum plantation and is making every efforts to protect the ozone layer in the terms of the Montreal Protocol.

[19] 2000 MLD 851.

The Court observed that ban on the air-conditioners and refrigerators due to deplete oxygen, beside the allegation having been converted by the respondents, the prayer loses sight of the beneficial effect of these modern budgets which are much more then its adverse effect if any. This is no infringement of any fundamental rights. Therefore, petition is dismissed in limine having no merit.

This petition was dismissed but in this petition issue of ozone depletion was raised under Vienna convention on ozone layer and Montreal Protocol which is now hot issue in the all countries. Now it is fact that ozone layer is depleting due to these gasses which was mentioned in the case.

L. SHAH MUHAMMAD vs. ADDITIONAL JUDGE, BAHAWALPUR and others[20]

The brief facts of the case that Faiz Ahmad and other respondents moved an application before Assistant Commissioner/Magistrate 1st class that Shah Muhammad had installed a diesel engine operated "Chakki"[21] in their crowded "Abadi" and was also causing damage to the adjacent properties. The learned Magistrate issued notice to the petitioner/respondent and after recording evidence of the parties vide order, dated 30-06-1996 directed Shah Muhammad to remove the said Ckakki. Shah Muhammad then filed a revision petition against the said order which was dismissed by the learned Additional Sessions Judge, Bahawalpur.

The petitioner installed Chakki which is operated with a diesel engine. Obviously, the noise made by the diesel engine and the tremor and vibration caused by he Chakki are not only source of discomfort and annoyance to the inhabitants of the locality, but also are injurious to human

[20] 1997 PcrLJ 1987.
[21] Chakki means flour grinding machine.

health. The constant noise shatters the human nerves and the smoke of diesel affects the general health.

While dismissing the petition, it was held that:

> "In the case of wrongful occupation of immovable property or exercise of any dominion over it the time factor is a relevant consideration in determining the application of section 133, Cr.P.C., but the same consideration does not apply to carrying on of a obnoxious trade or occupation resulting in continuing physical discomfort and injury to the health of the neighbours."

The petitioner operated the disputed Chakki even without obtaining a licence. He has no legal right to cause discomfort and health problems to the inhabitants of the locality for earning his livelihood. Even such like small units cannot be permitted to operate in residential areas. Hence, the writ petition is dismissed in limine having no merits.

M. SALAMAT ALI Vs. DEPUTY COMMISSIONER and others[22]

Brief facts of the case that Salamat Ali/petitioner had installed chilly grinding and rice husking machines in the plot No. 58, Southern Gate, Grain Market, Sahiwal during the year 1978-1979 under a licence issued by the Chairman, Municipal Committee. Respondent No. 3, an owner of plot No. 57 moved an application before the District Magistrate under section 133 of Cr.P.C for cancellation of the licence issued in favour of the petitioner for said business. In the application he mentioned that the noise produced by the said machines alongwith physical discomfort to him as well as other inhabitants and is injurious for health and a permanent nuisance.

After hearing the parties the Deputy Commissioner, Sahiwal passed the impugned order on 12-07-1993 directing the Chairman not to issue any further licence for the chilly grinding and rice

[22] 1997 MLD 2122.

husking business. However, for the removal of the machinery the parties were directed to seek the help of civil court.

Feeling aggrieved Salamat Ali/petitioner filed writ petition on 27-11-1994 getting declared the order passed by Deputy Commissioner without having jurisdiction, illegal, void, malafide and inoperative and the Municipal Committee may be directed not to interfere in his business.

The Court heard the arguments from both sides and observed that the area where the chilly grinding and rice husking machines are being operated in the thickly populated area. During these days when every effort is being made to remove the silent enemy of pollution adversely affecting the health of the citizens, the operation of the chilly grinding and rice husking machines has rightly been stopped by the Deputy Commissioner. Practically it becomes difficult even to take the breath when chilly grinding and rice husking machine is working. The vibration of the said machines is also a source of nuisance. With the passage of time there is increase of population in the urban area. So, he order passed by the Deputy Commissioner does not suffer from any illegality which had to be passed due to nuisance being created by the said machines being operated by the petitioner. Therefore, petition is dismissed in limine having no merits.

N. ABDUL QAYYUM, and others Vs. DIRECTOR GENERAL (EPA), and others[23]

The petitioners were residents of Altaf Park and Green Park, Shalimar Town, Lahore. They filed the writ petition for a public purpose, seeking a writ *mandamus* against respondents No. 1 to 3. It is claimed that respondents No. 4 to 10 are running their industrial units in the residential area, that the noise and other emissions crossed the permissible limits by these running units. The

[23] 1999 P.L.R.640

respondents No. 1 to 3 were repeatedly visited by the inhabitants of that area, asking them to intervene and to perform their legal obligations, but inspite of initial surveys and some reports, no positive action has been taken by them. It was claim that lives of the petitioners and other habitants have been miserable.

After hearing the parties held that the petition is disposed off with the direction that respondent No. 1 to 3 will entertain the representation made by the petitioners and proceed to deal with the same in accordance with the provisions of relevant law (Pakistan Environmental Protection Act, 1997), after affording opportunity of hearing to the persons likely to be adversely effected.

O. In re: POLLUTION OF ENVIRONMENT CAUSED BY SMOKE, EMITTING VEHICLES, TRAFFIC MUDDLE[24]

Supreme Court of Pakistan took Suo-Motu action regarding pollution of environment caused by smoke, emitting vehicles, traffic muddle etc. in Karachi.

Supreme Court passed interim order for taking effective and remedial measures in order to streamline the process of checking as a first step in eliminating air and noise pollution in Karachi Our relevant part of judgement regarding the elimination of the pollution caused by the smoke emitting vehicles, following interim order was passed by the Supreme Court.

a) A minimum of two mobile checking per week per district for at least 2-1/2 hours duration should be arranged in terms of the earlier order which is being practised. It may, however, be added that henceforth the Honorary Magistrate appointed by the Provincial Government with the approval of the Hon'ble Chief Justice, High Court, Sindh, be associated with the checking team and if S.T.Ms. are not available, the Honorary Magistrate shall try and dispose of summary cases at the time of checking.

[24] 1996 SCMR 543.

b) The monthly schedule of the mobile checking shall be issued by the S.T.M. or any person authorised by the commissioner without mentioning the checking locations which shall be decided by the checking team at starting the checking on that day.

c) A weekly report of such checking shall be submitted by the S.T.M./honorary Magistrate to the C.P.L.C., Central Report Cell, which shall compile the same and submit a consolidated report with comments and suggestions to the Assistant Registrar, supreme Court, Karachi after every three months.

d) It has been revealed from a report that K.T.C. Government vehicles including police vehicles and certain "marked" private transport vehicles are not challaned. This discrimination should end and all vehicles irrespective of their owners/drivers should be brought to book in case of violation of the law. The authorities concerned are directed to check vehicles irrespective whether they are marked or not, but if this policy of not challaning marked vehicles persists, the representative of C.P.L.C. associated with the checking team should note down the number of such vehicles and reports it to the C.P.L.C. Reporting Centre which shall forward it to the Assistant Registrar, Supreme Court, Karachi.

e) Motor vehicle inspection procedure should be totally overhauled and every week D.I.T., T&T, shall obtain the particulars of such vehicles to which fitness certificates have been issued by M.V.Is. according to rules and forward them to C.P.L.C., Central Reporting Cell which shall submit with comments to the assistant Registrar, Supreme Court, Karachi along with the quarterly reports.

The court also observed that one cause of pollution is the adulteration in the fuel and directed to have a good check at all levels like at refinery, Oil Company, during transit and at the petrol pumps.

P. Mrs. ANJUM IRFAN vs. LAHORE DEVELOPMENT AUTHORITY, LAHORE[25]

This writ petition decided on 14th June, 2002 by Mr. Justice Ch. Ijaz Ahmad. The petitioner has filed this writ petition with the following prayer:

> "In view of the above, it is most respectfully prayed that an appropriate writ may very graciously be issued and the respondents may kindly be directed to perform their duties in such a manner to ensure pollution free environment for the health and safe living of the citizens of Lahore."

This court keeping in view the controversy involved in this case, had recorded the statement of an expert, Professor Dr. Mumtaz Hussain and also called upon the Advocates, Dr. A. Basit, Dr.

Pervaiz Hassan, Sardar Shahid Iqbal, and Sheikh Muhammad Asad Ullah to assist the court as amicus curiae.

In view of expert and amicus curiae, court directed the respondents to implement the provisions of Pakistan Environmental Protection Act, 1997 in letter and spirit and frame necessary rules and regulations and issue necessary notifications under the provisions of the aforesaid Act in letter and spirit preferably within six months. They are directed to submit report to Deputy Registrar of this court within the stipulated period. Copies of this judgement also sent to the following authorities for necessary action and compliance:

1) Chief Secretaries/Inspectors General of Police of all Provinces.
2) Secretary Transport.
3) Secretaries to the Chief Executives of all Provinces.
4) Principal Secretary to the Chief Executive of the country.

Q. SHAHEEN WELFARE SOCIETY, (Redg) through GENERAL SECRETARY

Vs.

ENVIRONMENTAL PROTECTION AGENCY, LAHORE through DIRECTOR GENERAL And others.[26]

This private complaint decided on 25th March, 2005 by Syed Zamir Hussain, Chairperson and Manzoor Akbar Kokab, Member Legal in Environmental Tribunal, Lahore.

M/S Shaheen Welfare Society (Regd.) Hussain Town, Kalashahkaku, sheikhupura, Punjab has filed a private complaint under section 21 of Pakistan Environmental Protection Act, 1997 against six (6) different Industrial Units(respondents No. 3 to 8) arrayed in the area. Whereas respondents No. 1 and 2 are Environmental Protection Departments. According to complainant,

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[25] PLD 2002 Lahore 555.
[26] 2005 CLD 1267.

all six Industrial Units have been playing havoc because of pollution by way of emission and discharge of waste water into nearby "Nala Deg". Dangerous chemical emitted by these units not only lost its natural marine life like fish etc. but also has carried toxic obnoxious effect to such a great extent.

The Air pollution is also attributed to all the industries, especially the respondent No. 3, Ittehad Chemical, Kalashahkaku which allegedly discharges obnoxious gases, hovering in the near vicinity, whereas the local inhabitants have dwelling houses. Large scale spread of health problems and diseases due to these emissions from these units.

The applications moved by the respondents Nos. 3,4 and 7 under section 265-k, Cr.P.C. on the grounds inter alia that respondents have been wrongly joined in one complaint, so being civil nature, can not be charged collectively and proceeding before the Tribunal and attracts the rejection of complaint as being bad for multifariousness. The said applications by respondents Nos. 4 and 7 bearing reference of specific provisions of criminal Procedural Code, section 265-k and Civil Procedural Code Order 1, rules 1 and 3, to put/arose the question for jurisdiction of Tribunal as civil nature or criminal and complaint entertain under provisions of Environmental Protection Act, 1997.

Assistance provide by the learned counsels for both parties for presenting a healthy legal debate on the issue which is based on legal question which is pertaining to its Criminal or Civil Jurisdiction in the light of enacted provisions and rules made thereunder.

Under section 21(4) and (5)of the Act, the specific reference to the criminal jurisdiction and civil jurisdiction has been made in following words:

> "In exercise of its criminal jurisdiction, the Environmental Tribunal shall have the same powers as are vested in Court of Sessions under the code of criminal procedure". And
> "In exercise of the appellate jurisdiction under section 22, the Environmental Tribunal shall have the same powers and shall follow the same procedures as an Appellate Court in the Code of Civil Procedure."

In sub section 6 is mentioned that:

> "In all matters with respect to which no procedure has been provided for in this Act, the Environmental Tribunal shall follow the procedure laid down in the Code of Civil Procedure."[27]

After hearing the arguments of the parties Tribunal held that because of mis-joinder of respondents/alleged offenders, the complaint is not worth to be proceeded upon in its present form. It is therefore, while accepting the applications of the respondents the complaint is returned to the complainant with permission to re-file the same against each of the respondents separately provided if complainant wishes so.

[27] Section 21, PEPA, 1997.

CONCLUSION AND RECOMMENDATIONS

Air pollution is an emerging environmental problem and growing in Pakistan like any other developing country in the world. It is not just a local problem but rather a global environmental threat for the whole word. A large number of factors contribute to its increase day by day. Generally air pollution is an urban problem but it has also become a rural problem due to the increase in brick kilns and industries that have shifted to rural areas. For better and comfortable life clean air is necessary for mankind. That is why about four hundred years ago, William Shakespeare (scene 2 of Julius Caesar) said that "*I durst not laugh for fear of opening my lips and receiving the bad air*".

Air is an integral part of human life and other living beings as well. We take many things for granted. Air is one of them. If we do not protect it, it will destroy by the environment not only for us but also for our future generations. Therefore, we must keep air clean. Air consists of nitrogen, oxygen and argon. This is the system of Allah Almighty that human in take oxygen from the atmosphere and return carbon dioxide which plants assimilate in the presence of sunlight and return oxygen for consumption by human beings and animals.

Man is responsible for the destruction of air by his actions. That is why he has to take responsibility for the restoration and protection of atmosphere from pollution. After the industrial revolution mankind is producing oxides and other pollutants in large quantities which are created by factories and automobiles. Industrial and transport sectors are the main sources of air pollution. Large quantities of pollutants are released into the air by industrial units like power plants and leather industries. Power plants use diesel and furnace oil which produce NO_x, SO_2

and SPM that affect the environment. As industries grow, they release more and more pollutants in the air. Small and medium industries located within and around large cities contribute equally of omissions of gases.

The available data on air pollution in Pakistan is insufficient. Concentration of the pollutants is measured in Lahore, Rawalpindi, Islamabad and Peshawar for only short duration. Transport and energy sectors contribute about one half of No_x, two third CO and one half hydrocarbons emission in the air. Over the last few years, transport sector has increased tremendously due to increase in purchasing power and loan facilities provided by the banks. There are about 6 million vehicles on the roads in Pakistan. Pakistani vehicles emit more carbon dioxide, hydrocarbon and nitric oxides as compared to those of other developed countries. Municipal and medical wastes also contribute in air pollution.

As a result of all these factors air pollution not only impacts adversely on the health of people but also on that of animals, plants, agriculture, livestock, building material and structures, archaeological monuments and economy of the country. Pakistan losses about $370 million and with 6.4 million people hospitalized annually due to illness. Major cities of Pakistan have crossed the guidelines provided by WHO. It is realized that air pollution is a serious health hazard and it is a threat to welfare of the society. It is human nature to choose and accept some risks but in case of the quality of air they breathe they have no real control over rate. As blame for poor air quality often can not put on individual source without sophisticated reporting and monitoring mechanisms. The individual effort could not control this problem, so legislative measures at national level were taken to combat this evil.

Pakistan is a party to several international agreements on climate change, ozone layer and on air which impose a duty on the country to maintain and control the pollution at maximum level and to protect the environment for welfare and safe health of people. These multilateral agreements also provide the standards to control the issue of air pollution. Unfortunately, Pakistan could not fulfil the commitments under these agreements due to limited resources and lack of modern and new technology. But it is determined to honour these obligations and maintain standards provided by these agreements.

In Pakistan, we have some statutory laws that address this crime. Article 142 of the Constitution of Islamic Republic of Pakistan, 1973 empowers the National and Provincial Assemblies to legislate environmental laws. Pollution is much more harmful for human beings as compared to hydrogen bomb. So, various laws have been legislated under the Constitution of Pakistan. Pakistan environmental Protection Act, 1997 is the major law, the remedies available under this law are not the only remedies available for environmental protection and restoration but are in condition to other remedies available under general law for protection of environmental pollution. We have very few reported cases regarding air pollution which have been decided by the Superior Judiciary. Cases like Shehla Zia vs. WAPDA are milestone in the way of legal control of environmental pollution. The Honorable Supreme Court has started to take suo-moto actions in cases of environment degradation and a lot is being done, however, there is need for frequent and stronger actions by judiciary.

In the course of this research it has been observed that air pollution is a big problem for the country. It affects humans in the shape of different diseases. It has also adverse effects on animals, plants and economy of the country directly or indirectly. Pakistan has some laws related

to air pollution such as PEPA, 1997. Smoking Ordinance, 2002 etc are not being implemented fully and effectively. That's why the government is unable to control and protect the environment from this hazard.

There are some suggestions and recommendation to control, reduce and protect the environment from the air pollution, which are as follows:

i. To encourage the people to leave their cars at home and walk or ride a bicycle to travel short distances.

ii. Public transport should be effective so that people may prefer to travel by it instead of private vehicles as in the procedure being followed by the developed countries.

iii. To promote energy efficiency and conservation strategies. Energy efficiency means using technology to accomplish tasks with less energy consuming activities. This approach is not only cost effective ways of reducing harmful emissions from industries and vehicles but it also gives us to search for safer and cheaper alternative energy sources.

iv. To improve traffic management.

v. To improve fuel quality.

vi. Public transport mandatory on CNG instead of diesel.

vii. To reduce the difference between petrol and diesel.

viii. To introduce the petrol with low sulphur and no lead.

ix. Design cars wherein combustion temperature is lower and less nitrogen oxide is formed.

x. To develop the comprehensive transport policy to address air pollution issues and take steps to improve traffic engineering in all major cities.

xi. Substitution of fuels resulting in higher emissions should be made for both stationery and non-stationery sources.

xii. Remove sulphur dioxide from fuel by switching to a low sulphur fuel such as natural gas or even to a non-fossil source such as solar energy.

xiii. To introduce electric car train for long and short distance.

xiv. To install mandatory devices in the vehicles to control pollution emissions from diesel engines.

xv. The research laboratories should be set up in all major universities to meet the changing demands of the market. These laboratories should be responsible to conduct all necessary test proposed by work force to impose tax on some specific industry.

xvi. The Research laboratories should be responsible to generate data on all variables like sulphur oxide, carbon monoxide, nitrogen oxide, and hydrocarbons etc. related to environmental degradation.

xvii. The industries are forced to comply its NEQS by installing treatment plants.

xviii. Periodical in test of vehicles for emission should be ensured.

xix. Distribution of CNG be ensured in those areas which are not yet covered.

xx . Shift to cleaner fuels and technologies in industry.

xxi. Implementation of pollution charge system for industries as assigned by order under the Pollution Charge Industrial Rules 2001.

xxii. To introduce the use of new and modern technology and equipments in the industries.

xxiii. The coal fired brick kilns, steel melting and stone crushing units and cement factories located in urban areas must be closed off or shifted out side the urban areas.

xxiv. The owners of vehicles should be made responsible to get the annual permit from the environmental protection authorities.

xxv. To introduce an effective vehicular emission inspection and maintenance programes and inspection to the private sector.

xxvi. Change old engines from the vehicles which are emitting more than NEQ Standards.

xxvii. Enforcement of the laws of land without fear, favour and nepotism and without any discrimination.

xxviii. Implementation of NEQS should be ensured for transport and industrial sectors.

xxix. Promote the environmental awareness among the people through print and electronic media.

xxx. Also conduct the workshops about environment and relating laws for general public by environmental protection authorities.

xxxi. Trees plantation should be patronized by the Government. Every year, forest Department announces that thousands of trees are planted.

The implementation of existing laws should be ensured and severe penalties should be awarded to the violators without any discrimination and fear. Courts be directed to the matters on merit and if someone found guilty must be punished according to law. There is also need of amendments of some provisions regarding penalties because they have very small penalties. The most important thing is the implementation of laws and people should be aware about these laws. Violators should be discouraged though imposing harsh fine or penalties. Local Governments also ensure to use their powers under law and control and reduce air pollution from the society.

Superior Judiciary can also perform an important role in the reduction of pollution from environment for the welfare and safety of people. Supreme Court should take suo-moto actions regarding air pollution and other means of pollution. Pakistan also requires effective steps by the Superior Courts which will be better and useful for community at large. These are some suggestions being submitted, with the hope that they will assist a better and healthier environment protect the people from this curse.

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