**THE IMPACT OF AIR POLLUTION ON HUMAN HEALTH**

\*S.Rajendran (M.Phil, Research Scholar), \*\*DR.C K MuthuKumaran (Associate Professor).

Alagappa Institute of Management,

Alagappa University,

 Karaikudi, Pin – 630004.

**ABSTRACT**

The presence of impurities in an atmosphere that affect Nature of the environment including Human Health are known as air pollution, it reduce the life quality or interfere with the normal activities of life.Air pollution means any gaseous substance (including noise) micro substances of solid(Dust), liquid vapours which present in the atmosphere concentration that may lead to injurious to the living creatures like human’s or other living creatures like environment or a property in general. Major Air pollution occurs from large scale industries like power plants, Steel plants, Cement Plants, including crushers and smelters plants. Smaller sources are cars, buses, planes, trucks, and trains. Anthropogenic activities and naturally occurring sources such as windblown dust and volcanic eruptions. Air pollution has been aggravated by development that typically occurs as countries become industrialized, growing cities, increasing traffic, rapid economic development and industrialization, and higher levels of energy consumption. In India air pollution is widespread in urban areas where vehicles are the major contributors and in a few other areas with a high concentration of industries and thermal power plants.

 Vehicular emissions are of particular concern since these are ground level sources and thus have the maximum impact on the general population. This paper has made an attempt to find out the Impact of Air Pollution on Human Health.

KEYWORDS: ENVIRONMENT, POLLUTION SOURCE, IMPACTS, CONTROL MEASURES.

**INTRODUCTION**

**“PREVENTION IS BETTER THAN CURE**” Prevention from Pollution is a major global concern because of the harmful effects of pollution on a person’s health and environment. Environmental pollution arises in various forms, such as like air pollution, water pollution, soil pollution, etc... Air pollution may be defined as the presence of one or more contaminants like dust, mist, smoke and colour in the atmosphere that are injurious to human beings, plants and animals. There are many substances in the air which may spoil health of Humans, plants, animals and reduce visibility (lifetime). These arise both from natural processes and human activity. Substances not naturally found in the air or at greater concentrations are in different locations from usual are referred to as 'pollutants'. Individual reactions to air pollutants depend on the type of pollutant a person is exposed to, the degree of exposure, the individual's health status and genetics. On hot, smoggy days increase their exposure to pollutants in the air. With increasing the use of motorized transport is also expected to continue increase in the coming years, potentially worsening air quality. Poor air quality in turn has been shown to have seriously adverse effects on public health.

**OBJECTIVES**

* To assess the root cause for air pollution,
* To assess the impact of air quality on the health of people,
* To determine the need of action to control the Air Pollution sources
* Need of Raising awareness nationwide for prevention, control or abatement of environmental pollution

**STATEMENT OF A PROBLEM**

The effect of air pollution includes breathing (respiratory system) problems, aggravation of existing respiratory and cardiovascular disease, and alteration in body defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death.

A report from World Health Organization stats that 4.6 million people died every year due to direct Causes attributable to air pollution. Direct causes of air pollution related deaths include aggravated asthma, bronchitis, emphysema, lung and heart diseases, and respiratory allergies including STRESS.

“In 1984 Bhopal Disaster will be a worst short term civilian pollution crisis in India. Industrial vapours leaked from the Union Carbide factory, belonging to Union Carbide, Inc., U.S.A., killed more than 2,000 people outright and injured from 150,000 to 600,000 people, some 6,000 of whom would later died from their injuries”.

**RESEARCH METHODOLOGY**

Secondary Data’s are collected through Internet, via Annual Reports of Private & Public Sector Undertakings, Technical Journals, Regulatory Commissions, Govt. of India Gazette and Conference proceedings. This also includes important official publication, Financial Institutional Investors and statistical abstracts, reports and Indian, Foreign journals.

A detailed study of the official websites of the Government institutions has been taken for analyzing an ambient air quality which is executing a Nation-wide (NAMP) National Air Quality Monitoring Programme. The network consist of 332 operating stations covering 121 cities/towns in 25 States and 4 Union Territories of the country.

 i) National Ambient Air Quality Monitoring Programme (NAMP)

ii) Tamilnadu Pollution Control Board (TNPCB) (State Level Agency)

**CONCEPTUAL FRAME WORK FOR ASSESSMENT & TECHNIQUES OF AIR QUALITY**

 The objectives of the NAMP are to determine status and trends of ambient air quality, to ascertain whether the prescribed ambient air quality standards are violated, to Identify Non attainment Cities, to obtain the knowledge and understanding necessary for developing preventive and corrective measures, to understand the natural cleansing process undergoing in the environment through pollution dilution, dispersion, wind based movement, dry deposition, precipitation and chemical transformation of pollutants generated.

The composition of **Good Air to Inhale** is given below:

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| **Composition of Gases**  |  **Content Level** |
| Nitrogen | 78% |
| Oxygen | 21% |
| Argon | less than 1% |
| Carbon dioxide | 0.037% |
| Water vapour | Remaining |
| Ozone, Helium and ammonia | Trace amount |

The air quality of different cities/towns has been compared with the respective National Ambient Air Quality Standard (NAAQS). The air quality has been categorized into four broad categories based on an Exceedence Factor (the ratio of annual mean concentration of a pollutant with that of a respective standard).

**The four air quality categories are:**

* Critical pollution (C) when Exceedence Factor is more than 1.5,ug/m3
* High pollution (H) when the Exceedence Factor is between 1.0 - 1.5 ug/m3
* Moderate pollution (M) when the Exceedence Factor is between 0.5 - 1.0 ug/m3
* Low pollution (L) when the Exceedence Factor is less than 0.5 ug/m3

**Pollutants can be classified as either primary or secondary.**

* Primary pollutants are substances directly produced by a process, such as ash from a volcanic eruption or the carbon monoxide gas from a motor vehicle exhaust.
* Secondary pollutants are not emitted. Rather, they are form in the air when primary pollutants react or interact. An important example of a secondary pollutant is ground level ozone - one of the many secondary pollutants that make up photochemical smog.

While some pollutants may be both primary and secondary, they are both emitted directly and formed from other primary pollutants.

**Primary pollutants produced by human activity includes...**

* Oxides of sulfur, nitrogen and carbon
* Organic compounds, such as hydrocarbons (fuel vapours and solvents)
* Particulate matter, such as smoke and dust
* Metal oxides, especially those of lead, cadmium, copper and iron
* Chlorofluorocarbons (cfcs)
* Hazardous air pollutants (hap)
* Persistent organic pollutants (pops)
* Odors

**Secondary pollutants** include some particles formed from gaseous primary pollutants and compounds in photochemical smog, such as nitrogen dioxide, ground level ozone and peroxyacetyl nitrate (PAN).

**COMMON ATMOSPHERIC POLLUTION SOURCES AND THEIR POLLUTANTS**

Among the variety of air pollutants such as SUSPENDED PARTICULATE MATTER (SPM), SULPHUR DIOXIDE (SO2) and OXIDES OF NITROGEN (NOX) are considered to be major pollutants in India.

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| --- | --- | --- | --- |
| **Sl.No** | **Category** | **Source** | **Emitting pollutants** |
| 1 | Forest/Agriculture/Natural Sources (Strom/Volcanic Eruption etc…  | Open burning | Suspended particulate matter, carbon monoxide, volatile organic compounds |
| 2 | Mining and quarrying | Coal mining, Crude oil and gas production, Stone quarrying | Suspended particulate matter, sulphur dioxide, oxides of nitrogen, volatile organic compounds |
| 3 | Power generation | Electricity, gas, steam | Suspended particulate matter, sulphur dioxide, oxides of nitrogen, carbon monoxide, volatile organic compounds, sulphur trioxide, lead |
| 4 | Transport | Combustion engines | Suspended particulate matter, sulphur dioxide, oxides of nitrogen, carbon monoxide, volatile organic compounds, lead |
| 5 | Community service | Municipal incinerators | Suspended particulate matter, sulphur dioxide, oxides of nitrogen, carbon monoxide, volatile organic compounds, lead |

**IMPACT OF AIR POLLUTION ON HEALTH OF PEOPLE**

Some of the gases can seriously and adversely affect the health of the people and should be given due attention by the concerned authority. The below mentioned gases are mainly outdoor air pollutants but some of them can and do occur indoor depending on the circumstances of the sources.

**Tobacco smoke.** Tobacco smoke generates a wide range of harmful chemicals and is a major cause for health illness, which known to cause for cancer, not only to the smoker it will affect passive smokers too. It is well-known that smoking affects the passive smoker (the person who is in the vicinity of a smoker and is not himself/herself a smoker) ranging from burning sensation in the eyes or nose, and throat irritation, to cancer, bronchitis, severe asthma, and a decrease in lung function.

**Biological pollutants.** These are mostly allergens that can cause asthma, hay fever, and other allergic diseases.

**Volatile organic compounds.** Volatile compounds can cause irritation of the eye, nose and throat. In severe cases there may be headaches, nausea, and loss of coordination. In the longer run, some of them are suspected to cause damage to the liver and other parts of the body.

**Formaldehyde.** Exposure causes irritation to the eyes, nose and may cause allergies in some people.

**Lead.** Prolonged exposure can cause damage to the nervous system, digestive problems, and in some cases cause cancer. It is especially hazardous to small children.

**Radon.** A radioactive gas that can accumulate inside the house, it originates from the rocks and soil under the house and its level is dominated by the outdoor air and also to some extent the other gases being emitted indoors. Exposure to this gas increases the risk of lung cancer.

**Ozone.** Exposure to this gas makes our eyes itch, burn, and it has also been associated with increase in respiratory disorders such as asthma. It lowers our resistance to colds and pneumonia.

**Oxides of nitrogen.** This gas can make children susceptible to respiratory diseases in the winters.

**Carbon monoxide.** CO (carbon monoxide) combines with hemoglobin to lessen the amount of oxygen that enters our blood through our lungs. The binding with other heme proteins causes changes in the function of the affected organs such as the brain and the cardiovascular system, and also the developing fetus. It can impair our concentration, slow our reflexes, and make us confused and sleepy.

**Sulphur dioxide.** SO2 (sulphur dioxide) in the air is caused due to the rise in combustion of fossil fuels. It can oxidize and form sulphuric acid mist. SO2 in the air leads to diseases of the lung and other lung disorders such as wheezing and shortness of breath. Long-term effects are more difficult to ascertain as SO2 exposure is often combined with that of SPM.

**SPM (suspended particulate matter).** Suspended matter consists of dust, fumes, mist and smoke. The main chemical component of SPM that is of major concern is lead, others being nickel, arsenic, and those present in diesel exhaust. These particles when breathed in, lodge in our lung tissues and cause lung damage and respiratory problems.

The importance of SPM as a major pollutant needs special emphasis as

 a) It affects more people globally than any other pollutant on a continuing basis.

 b) There is more monitoring data available on this than any other pollutant.

 c) More epidemiological evidence has been collected on the exposure to this than to any other pollutant.

### Air pollution control Measures

**1. Plantation.**

More and more trees must be planted everywhere. Environmental protection needs to be considered as an important domain for industrial and other developmental activities in India. The Green belt objective varies from country to country and region to region. The common objective is to protect natural environments such as like biodiversity etc, to improve air quality of the region, pollution control has to maintain micro climate of the region, and Green Belt Development is an important tool that aims at overall improvement in the environmental conditions of the region.” GO GREEN LIVE CLEAN”

**2. Alternative Sources of Energy.**

Alternative energy is any energy source that is an alternative to (coal) fossil fuel. Such alternative energy Sources are basically a Renewable Energy, Such Energy Source are…

* Biomass plants with Advanced ESP’s
* Fuel Cells
* Geothermal
* Hydro-electric
* Solar
* Solar Thermal
* Wind

**3. Alternative Fuel to Transport Vehicles.**

An alternative fuel for vehicle is that a vehicle runs on a fuel other than traditional petroleum fuels (petrol or Diesel fuel). Such alternate fuels are…

* Biodiesel
* Compressed Natural Gas (CNG)
* Electric Vehicles (EVs)
* Ethanol (E85) - Flexible Fuel Vehicles
* Hydrogen & Fuel Cell Vehicles
* Liquefied Natural Gas (LNG)
* Liquefied Petroleum Gas (LPG / Propane)
* LPG and CNG Conversions
* Neighborhood Electric Vehicles (NEVs)

Alternative forms of power focus on developing fuel cells, alternative forms of combustion such as GDI and HCCI, and even the stored energy of compressed air (e.g. electric car, hybrid electric vehicles, solar powered)

**4. Shifting of Industries.**

In order to maintain the city’s ambience and pollution free environment in important and historic areas polluting industries should be modernized to acceptable limit of pollution or it must be shifted from residential areas to industrial areas.

**5. Establishment of Automobile Traffic Control Areas.**

Some roads should be reserved exclusively for automobile traffic. On the other hand, congested roads and lanes should be declared as automobile traffic control area. Heavy traffic location needs to be analyzed and smoke observer must be installed to avoid pollution.

**6. Alternate Mode of Transport inside Urban Area.**

For local purposes, the use of bicycles should be encouraged. **Best example is China**

**7. Electric Trains.**

Electric trains may also be helpful for commuters from suburban areas. It will help to control air pollution in urban areas and to avoid Traffic.

**8. Pollution Check of Vehicles.**

Immediate action need from Government for a ban on old vehicles after 10 years. Pollution Test of vehicles should be checked seriously on regular basis.

**9. Environmental Impact Assessment.**

Environmental impact assessment should be carried out regularly to identify and evaluate the potential and harmful impacts of industries on environment.

**10. Strict Action:**

Government should take strict action against those industries which discharge higher quality of pollutants than the level prescribed by the State Pollution Control Board.

**CONCLUSION**

Life Begins at Breath, without breathing (oxygen) we can’t live, Life runs on Breathing. The (oxygen) air we breathe sustains us. So, let us make everyday a good day for everyone. “NO POLLUTANTS, NO POLLUTION” Need a help from all to control pollution. As there is the need for continuously enlighten and educate the public about the causes and an effect on air pollution, which makes us to realize the dangers and health hazards of living in polluted environment.

Always “PREVENTION IS BETTER THAN CURE” We must help to fight Global Warming by doing the following steps…

* Avoid burning plastics. “NO TO PLASTIC” … Maintain “PLASTIC FREE ZONE”
* Plant more trees “PLANT A TREE = PLANT A LIFE”.
* Doesn’t waste water “SAVE WATER SAVE LIFE”.

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