

# Methods to Control Toxic Air Pollution around Major Cities in India

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**Abstract**—Recent happenings around the nation to be a difficult to believe among the one. Industrialized novelty and opening are continuing goal, protected in the performance of the nation progress to become position, effectively and economically. Also occasionally look at a glance in the pathway to roll back the hard usage of fuels to save energy in the country. Further there is a need for the energy demand for the at the instant, also for the forthcoming clock. A number of measures to be enforced to bound the air pollution in a equivalent approach. Whatever the crisis made for the 'energy' arises for the present, and the future, the analogous opinion developed for the respiratory oxygen air (clean air) for existing age group, and also for the future age. The World Health Organization (WHO) consideration on the most recent year showing to 13 out of the mainly polluted 20 cities in the world were in India. This manuscript give you an outline on expressions of life irregularity that of pollution. It straightly a way that poor impact, mainly in accurate climate conditions. Mercury point could be ramped over the world superior than 0.8°C over the past ten decades, this rise because of human produced emissions analysis to industrial developments. This is significant to slice the dissimilarity of global warming potential.

**Keywords-** WHO, PPM, GWP, AQI, PM, NAQM, Energy, Emissions, GIS.

## I. INTRODUCTION

Categorically a number on group of affluence, the pollution were emerge generate by air in the environment as higher risk to the health. Industrialization could be the intention but not the response. An engineering approach is exactly opposite to that of an environment creatures. However the diseases counter the living begins in the country. A step measure is a commitment to safeguard the living begins not only in the nation but also taking to last person in the universe. So we can minimize the different air borne diseases from heart stroke, lung cancer, asthma, other respiratory related diseases. The WHO made an assessment on AQI of health and harmful pollution levels. Preferably in lower and higher income countries invariably feel the risk of outdoor pollution with 87 percent i.e. three million early deaths that could occurred in Western Pacific, and South-East-Asia premises. The air pollution related high death toll rose mainly because of early death, cardio-vascular diseases declared by the scientists.

## II. EMISSIONS FROM THE FOSSIL FUELS

The energy obtained from the fossil fuels must have release the accelerated rate of carbon emission, which has made available during burning at various thermal power plants, coal based power plants mostly. Whereas the rest of the CO<sub>2</sub> were released during very high density of population using their own vehicles for transportation, that means under the non-usage of public transport like bus, train etc,. The emissions could be the

reason of affecting the "Green House gases", which pollute the natural sources, like plants habitat, water bodies, wild animal habitat, human habitat, etc,. will leads to rise in Global warming potential magnitude over the alarming level. The maximum of emissions form CO<sub>2</sub> exist during process in natural gas, oil, and coal fuels. The following table.1 showing the pollutant exist in fuel sources.

TABLE I. EMISSIONS FROM THE FOSSIL FUELS (POUNDS PER BILLION BRITISH THERMAL UNIT)

Pollutant	Natural gas	Oil	Coal
Carbon Dioxide	1,17,000	1,64,000	2,08,000
Carbon Monoxide	40	33	208
Nitrogen Oxides	92	448	457
Sulfur Dioxide	1	1,122	2,591
Particulates	7	84	2,744
Mercury	0.00	0.007	0.016

Source: EIA - Natural gas issues and trends

## III. CURRENT SCENARIO OF AIR POLLUTION IN INDIA

India is now shown decelerated figure on fresh, protected air. Out of 132 countries reviewed by Yale and Columbia, Country positioned last, i.e. we have most polluted air in the universe. Also chronically founded Indian cities have most horrible forms of polluted air. Particulate matter(PM), which was closely monitored pollutants, is the main reason of the rising air pollution in this South Asia sub continent between Arabian sea and bay of Bengal marine boundaries. The PM amplified more than four to five times in several parts of the city as indicated by WHO norms. Eventually it develops ultimate health problem for the people living and breathing with polluted air across the cities daily. The air quality index helps to know what living air quality means to. The NAQM (National Air Quality Monitoring) Program identified nearly 50 percent of the Indian cities have already reached levels of PM. There are 63 cities in critical level, 36 with high level, and 19 at moderate level. Apart from 121 cities from India, we have only three least polluted city in the nation namely Dewas(Himachal pradesh), Tirupati(Andhra pradesh), and Kozhikode(Kerala state) were identified at low pollution inside the margin level. Northern province of country familiar with increased pollution, whereas on southern province trend to lowering level. Indoor pollution from house hold cooking plays big role of high discharge of polluted gas. The house hold PM pollution level to be 350 micrograms/m<sup>3</sup>, it is 10 times higher than the limit set by US Environment Protection Agency. Preferably in rural house hold even bad with rest of the outdoors air in India. The

AQI in the following table shows the understanding way of level by its colour margins. Its concentration consists of small particles, having another problem of respiratory, other diseases as WHO stated.

TABLE II. AIR QUALITY INDEX ON HUMAN HEALTH

Air quality index AQI	Health margin	Indication of colour
0-50	Good	Green
51-100	Moderate	Yellow
101-150	Unhealthy for sensitive groups	Orange
151-200	Unhealthy	Red
201-300	Very unhealthy	Purple
301-500	Hazardous	Maroon

IV. OUTCOME OF AIR POLLUTION: ON HUMAN HEALTH, ANIMALS AND ATMOSPHERE

Similar fashion what we known already because of air pollution harmonically leads to

- Directly
- visibility,
- intensity of sunshine,
- precipitation amount, and
- acid rain.

Indirectly

- Change in natural climate by rise of temperature, melting of snow,
- increase in carbon dioxide,
- increase in particulates,
- holes in ozone layer, etc.

The air pollution can reason to air borne diseases to:

- Problem to human health,
- Problem to animals and plants,
- Problem to atmosphere, and
- Other effects.

A. PROBLEM TO HUMAN HEALTH:

- It cause to death
- it give asthma problem
- it may leads to cancer due to carcinogenic content
- it create neuron behavior disorder
- it affect endocrine, reproductive, and immune systems
- to be the major cause for headache and dizziness
- it affect the natal, and aged like coughing and wheezing
- it affect inside and outside organs of body such as eyes, mouth, and throat



Figure 1. School children's with 'Mask' having pollution background over the road

B. PROBLEM TO ANIMALS AND PLANTS:

- Fluoride is a pollutant, which can lead to fluorosis surrounded by animals.
- Harmful to trees, fruits, vegetables, flowers, etc
- Molecular addition of sulfur dioxide exceeds a particular level, the cells turn into inactive and destroyed, resulting in tissue membrane collapse and leaves are dried. Barley, Cotton, wheat, and apple are more sensible.
- Fluorides are responsible for various types of injuries to plants.
- The apple leaves, apricot, fig, peach and prune are more infer to air borne fluorides.
- Photosynthesis and respiration of plants can be affected by fluorides.
- Fog, and Smog dust cause injury to plant life.
- Chemically chlorine, ammonia, hydrogen sulfide, etc., are also other harms to vegetation habitat.

C. PROBLEM TO ATMOSPHERE:

- Potential effect to Global warming
- Change in pre monsoon, monsoon, post monsoon rainfall periods, other effects
- Change in relative humidity
- Rise in global temperature
- Change in mercury level
- Affect the green house gases
- Depletion on Ozone layer
- 'Smog dom' is formed in large cities
- Affect the visibility of various transport mode like ship, rail, air route, road, etc.,

D. OTHER EFFECTS:

- Pollutant like smoke, dust on oxides of sulphur can damage to civil construction structure
- Materials used for construction like steel, copper, alloy were corrosive in nature because of pollutant contaminated in air
- Colour change occurs due to ageing phenomenon on Hydrogen sulfide

V. POLLUTION(S) BY CONVENTION(S)

The present environmental protection of various law can enforce as a control measures to tackle legally by the direction under jurisdiction

- The Indian Forest Act, 1972
- The Atomic Energy Act, 1962
- The Factories Act, 1948
- The Insecticides Act, 1968
- The Wild life (Protection) Act, 1972
- The Water (Prevention and Control of Pollution) Act, 1974, 1977
- The Forest (Conservation) Act, 1980
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Motor Vehicles Act, 1988
- The National Environmental Tribunal Act, 1995

The Air (Prevention and Control of Pollution) Act, 1981

The Act which was passed for the "Prevention, Control and Abatement of air Pollution". This law defined an air pollutant as "any solid, liquid or gaseous substance present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment". In this Act, power to declare air pollution, control areas has been given to the state government after consulting the state board. By this, it may control or even prohibit burning of certain materials in those specific areas. This Act requires approval prior to operating any industrial plant.

VI. PREVENTION AND CONTROL METHODS OF AIR POLLUTION

There are several methods to prevent and control the air pollution has been listed below:

A. Identification:

- High pollution zones should be properly identified and Global Information System (GIS) tag should be given
- Separating pollution zones versus living zones
- Periodical survey should be taken similar to those followed for population, election, etc.,
- Air pollution hot spots will be identified, grouped, and operated by zonal coordinators

B. Industries:

- Control at the each point of its origins in factories
- Helping industry with those technology which could reduce origination of smoke from companies
- Involving industry to reduce air pollution below the WHO norms level
- Offering special rewards to the low, and minimum polluted companies, labor zones
- Offering penal charges to those companies, labor zones emitting high, and above norms level
- Organizing general body meeting directly, and indirectly to discuss air pollution, its effect

C. Transport:

- Option to use coal and gas by gas electricity

- Mechanical maintenance should be properly done to the equipments discharging maximum air pollution like exhaust hose, etc.,
- Making shift to green transport like biogas fuel, electric vehicle, etc.,
- Offering cheap mode to green public transport
- Constructing small and medium walking corridors between towns

TABLE III. POLLUTION VARIES OVER THE PERIOD OF TIME

Causes	1940s - 1950s	1960s -1980s	1980s -2000s and Later
Industries (Power, Manufacturing)	Sulphur Dioxide, Soot	Sulphur Dioxide, Carbon Monoxide, Lead, Ozone Layer depletion	Sulphur Dioxide, Carbon Monoxide, Nitrogen Dioxide, Lead, Ozone Layer depletion, Particulates matter, Soot
Trucks	Light loaded	Moderate	High power trucks
Car	Yes	Yes	Diesel Cars, SUVs, AC Cars
Motor cycle	Yes	Yes	Multi cylinder Engine
Cycle	Yes	Yes	No
Walking	Yes	Yes	30 percent decrease in walking

- Distance indicators to be placed on all directions of the road, so that minimizing fuel requirement
- Proper fuel refining should be done before delivering
- Reducing the quantity of fuel which cause CO2 emissions
- The table.3 shows causes of pollutants

D. Power generation companies:

- Using low emission fuels if possible
- Switching to alternative fuels
- Monitoring smog, dust, visibility, etc., closely
- Machine heat should be properly recovered for next process thereby saving energy
- Integrating power grids
- Providing electricity to last person in the last remote village
- Collecting pollution related feedback from adjacent villages, towns, zones, etc., and act accordingly

E. Indoor:

- Option to use coal and gas by gas electricity
- Providing alternative fuel for cooking in home kitchen's and hotel kitchen's

F. Proper urban planning:

- Constructing the energy efficiency of buildings;
- Easy to each every were
- By traffic free zones
- Using natural light on day time
- Operating public transport

G. Dilution:

- Growing vegetation and plants between factories and residential areas
- Planting more trees and making environment more strong
- Preparing green belt regions on Nation Importance

H. Act:

- Air pollution can be controlled in many countries by legislation as "no smoking zone".
- Building roads, rail and water infrastructure for the fast traffic free transportation
- Building public conveyance system and making it more strong so people could use less cars and other vehicles

I. Health role:

- Community health nurses can influence air quality through detection, community education, and lobbying for appropriate legislation.
- Creating awareness on air pollution
- Providing health check up camp were the PM level over the standard norms
- Issuing subsidy to affected peoples and taking those to further medical facilities

J. Standard for air quality:

- Finding ways to reduce use of those chemicals which affect the environment

K. Laboratory equipment:

- Ambient air monitoring station
- PM level monitoring station
- Portable gas analyzer
- Atmosphere visibility over pollutant

L. Action-plan smoke control

M. Trending on air pollution

N. Taking technology to a common man

O. Proper usage of sources

P. Warning to the public

Q. Response from the agencies

R. By environment monitoring stations

S. Experimentation on air pollution studies

T. Research on air pollution studies

VII. WHAT WE CAN DO?

- Check the daily air quality forecast through news channel, TV, Radio, online to learn PM levels
- Reduce the amount of time outside when pollution is high
- Plan outdoor activities when ozone levels are lower. usually during morning and evening.
- Exercise away from roads and highways. Particle pollution is usually worse near these areas

- Do easier your outdoor activities, such as walking instead of running or using a riding lawn mower instead of a push mower.
- Burn only, dry seasoned hardwood
- Store freshly cut wood for eight to twelve months before use.
- Avoid burning wet wood for any reason
- Certify industries and vehicles, etc., to monitor closely the PM level by authorities.

TABLE IV. GWP AND OTHER PROPERTIES

Green house gas	Chemical formula	Concentration	Annual increase	Relative absorption capacity
Carbon Dioxide	CO <sub>2</sub>	355 ppmv	1.8 ppmv	1
Methane	CH <sub>4</sub>	1.72 ppmv	10-13 ppbv	58
Nitrous Oxide	N <sub>2</sub> O	310 ppbv	0.8 ppbv	206

ppmv = parts per million by volume,

ppbv = parts per billion by volume

The table.4 shows alarming properties of GHS.

VIII. CONCLUSION

Whatever is done earlier is not significant effect which changes on the environment. But it is customary to address and review the policy matters were the change perhaps. The bodies which engaged themselves to decelerate the toxic air with a matter of concern, thereby providing clean air on enough possibilities for the present, also for the future generation. The reach out of growth for the public as well as plant life, and animal habit. The right path of progress could improve the biological changes thereby controlling the noxious matter with in the permissible level and suppress GWP. The choice of alternative fuel could latter become as conventional and ladder of conventional clean air on higher elevation for the nation growth.

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