

Tackling Air Pollution

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We refer to air pollution as the contamination of ambient air by any harmful or poisonous substance or pollutants.

Types of Pollutants

Primary pollutants include ash, nitrogen oxides produced during high temperature combustion, carbon monoxide from fuel combustion, vehicle exhaust and sulphur oxides from industrial units produced, (VOC) volatile organic compounds (methane, benzene, toluene, xylene, 1, 3, butadiene, etc.) originating directly from a process.

Other pollutants include particulate matter (PM), from natural dust storms, forest grassland fires also smoke, due to human actions like burning forest fuels, power plants, industrial and construction activities, ammonia emissions from agricultural processes, pharmaceutical industries, persistent free radicals connected to fine dust particles; malodour from rubbish and sewage dumps, fumes from consumer aerosol sprays, paints and varnish, cigarette smoke, in addition to toxic metal compounds of lead and mercury and radioactive pollutants due to natural radioactive decay of radon.

Biological sources of air pollution comprise, indoor gases and particulates like dust that people produce from minutes skin flakes, decomposed hair, pet's dander, faecal droppings, mould forms in walls generating mycotoxins and spores, garden pollen dust, etc. Secondary pollutants are ones not emitted directly but are reaction products of primary pollutants like the formation of ground level ozone that make up a photochemical smog.

Effects of Air Pollution

Air pollution is one of the biggest challenges the world over threatening human and animal existence due its ill effects of global warming, smog, acid rains, respiratory diseases, lung cancer and other ailments. According to the World Health Organization (WHO), 90% of the world's population faces air pollution dangers. The concern here is that 14 of the world's 15 most polluted cities are in India and unless we fight this menace seriously, it could snowball into a major crisis making India soon into an inhabitable

region, especially for its children and older citizens. Economy of any country prospers only when healthy people run businesses in its full efficiency. Sick people stay out of work costing a country's economy seriously.

Controlling Air Pollution

Prevention is better than cure, is a statement very apt for this serious issue of pollution. Regular monitoring and prevention methods both from government and from individuals are important. Air Quality Index (AQI) makes understanding air quality easy by transforming air quality data of various pollutants into a single number (index value), terminology and colour.

Introducing mandatory government laws and regulations for using green energy (wind, solar, other renewable sources, etc.), promoting energy efficient electric vehicles and minimizing use of fossil fuels become necessary. At an individual level, people should make use of buses, trains or cycle to commute. Use energy wisely and use household electrical goods only when necessary as we must burn fossil fuels to generate electricity.

Some effective measures that could improve the lives of millions of people across the world by getting air pollution under control are:

1. Introduce post-combustion emission standards and controls or end-of-pipe methods to reduce, particulate matter, SO₂ & NO₂ at power stations, brick kilns and industries.
2. Improve emission standards for vehicles, specially focusing on regulation of diesel vehicles, with regular inspection and maintenance by enforcing mandatory checks and repairs.
3. Encourage use of public transport vehicles, cycle bikes, etc.
4. Control dust pollution by suppressing construction and road dust; and use of mechanical dust collectors, electrostatic precipitators capable of removing fine particulates such as dust streams and smoke from air.
5. Regular sprinkling of water can control dust pollution largely.

6. Increase green areas by carrying out tree plantations.
7. Ban, open burning, of both agricultural crop residues and household wastes.
8. Introduce covered storage and efficient application of livestock manures; encourage anaerobic digestion.
9. Use nitrogen fertilizers efficiently for e.g., substitute urea with ammonium nitrate or use along with urease inhibitors.
10. Use low sulphur fuels with stricter control of particulate emissions during international shipping.
11. Restrict too much use of solvent in industrial and household paints and arrest leak and/or incineration.
12. Use clean cooking and heating fuels, electricity, natural gas, liquefied petroleum gas (LPG), biogas and briquettes, etc., instead of coal.
13. Foster use of renewable like wind, solar and hydropower for electricity generation and encourage use of energy efficient household appliances, electric vehicles for transport.
14. Encourage effective solid waste management by centralized waste collection, separation and treatment.
15. Recycle and reuse things (plastics, clothing, paper, glass, other household equipment's, etc.) wherever possible to minimize unnecessary industrial production that also creates pollution.

AQI Category, Pollutants and Health Breakpoints									
AQI Category (Range)	PM₁₀ (24hr)	PM_{2.5} (24hr)	NO₂ (24hr)	O₃ (8hr)	CO (8hr)	SO₂ (24hr)	NH₃ (24hr)	Pb (24hr)	Associated Health Impact
Good (0-50)	0-50	0-30	0-40	0-50	0-1.0	0-40	0-200	0-0.5	Negligible
Satisfactory (51-100)	51-100	31-60	41-80	51-100	1.1-2.0	41-80	201-400	0.5-1.0	Possibly could cause slight discomfort while breathing in sensitive individuals.
Moderately polluted (101-200)	101-250	61-90	81-180	101-168	2.1-10	81-380	401-800	1.1-2.0	Individuals (especially children & older adults), persons with heart ailments or lung disease (asthma) could experience breathing discomfort.
Poor (201-300)	251-350	91-120	181-280	169-208	10-17	381-800	801-1200	2.1-3.0	Prolonged exposure to poor air could cause breathing discomfort to individuals suffering from heart disease.
Very poor (301-400)	351-430	121-250	281-400	209-748	17-34	801-1600	1200-1800	3.1-3.5	Individuals having lung and heart diseases could additionally suffer from respiratory ailments on prolonged exposure.
Severe (401-500)	430+	250+	400+	748+	34+	1600+	1800+	3.5+	It seriously affects health of people with lung and/or heart disease. Even healthy individuals could suffer from respiratory issues and experience discomfort during light physical activity.

We can prevent air pollution only if we stop using all toxic substances causing it. Ceasing the use of all fossil fuel-burning processes is far-fetched and unlikely to happen. The best possible in this scenario is to make rules, set stringent regulations both on industrial manufacturing stages and at consumer, handling levels, primarily designing it to reduce harmful emissions into the earth's atmosphere.