



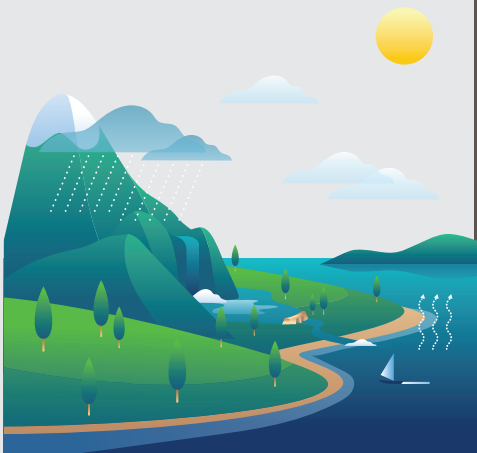
50
YEARS IN INDIA



THE AIR WE BREATHE

Nature's Free Service





The earth sustains life in large part due to its atmosphere. Clean air, good weather and a favorable climate are essential for a good quality of life. The atmosphere also regulates precipitation and water quality, which are important for availability of drinking water, agricultural and industrial production and for nature. Nature provides these free services on which our health and prosperity are dependant.

The world's forests absorb a third of the global carbon dioxide emissions from fossil fuels every year. Trees absorb pollutants like carbon dioxide, carbon monoxide, sulfur dioxide, nitrogen oxides, particulates and some volatile organic compounds. They also mitigate greenhouse gas effect and release life giving oxygen.



However, industries, agricultural production, transportation, construction activities, including recreational activities are releasing excessive quantities of harmful substances, including gases and particles into the earth's atmosphere. The main pollutants are sulphur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter (smaller than $10 \mu\text{m}$), and particulate lead.



All living beings are affected by atmospheric pollution. In humans, it is the second leading cause of diseases like stroke, cancer and heart disease, in addition to loss of years of quality life.



How **India** fares

Indian cities have some of the highest global levels of PM_{2.5} - the most harmful of all particulate pollutants. Emissions from all types of vehicles, road and construction dust, industrial pollution, and biomass (stubble) burning from other regions are the major causes of air pollution in our cities. 15 of the top 20 polluted cities in the world are in India, with Gurugram topping the list in 2018.



Pollutants not only just affect the area/country of their origin but impact a much wider geographical area. For example, gases and particles from agricultural stubble burning in the neighbouring states contributes as much as **40%** to the seasonal air pollution in Delhi.

TREES HELP MAINTAIN A HEALTHY ATMOSPHERE

Fighting pollution: Trees absorb carbon dioxide, sulphur dioxide, carbon monoxide, and release oxygen. One large tree can provide a day's supply of oxygen to four people.

Reducing noise: A belt of trees 100 feet wide and 45 feet high can reduce highway noise by 50%, with the leaves and branches absorbing most of the sound waves.

Cooling the atmosphere: A tree is a natural air conditioner. The evaporation from a single tree can produce cooling effect of 10 room-size ACs, operating 20 hours a day.

Why we should **care**

The World Health Organisation (WHO) highlights air pollution as the greatest environmental risk to human health. In India, air pollution is a serious health issue, ranking higher than smoking, high blood pressure, child and maternal malnutrition, and risk factors for diabetes.

Air pollution is the **5th largest cause of death** in India and **kills an average of 8.5 out of every 10,000 children** before they turn five. In 2017 alone, over 1.2 million deaths in the country were attributable to air pollution and India has the second largest risk of type 2 diabetes due to air pollution.



Nature suffers from atmospheric degradation due to air pollution as well. Acidification of soil, water and vegetation is a direct result of polluted air. Poor air quality also reduces crop productivity and groundwater quality on which humanity is dependant for survival. Air pollution causes excessive nutrient build up in waterbodies resulting in largescale death of fish and other aquatic life. Such incidences affect many fishing communities whose livelihoods are dependant on healthy aquatic ecosystems.



What needs to be **done**

Air pollution is becoming a major health problem that affects millions of people in India and worldwide. It is also a complex problem and needs to be addressed at the individual, regional, national and international levels.

It is clear that nature is degrading and so is its free service of absorbing pollutants, regulating dust, ash, pollen and smoke through forests and trees.

Only through sustained, tangible action can we give nature and ourselves a fighting chance.

CONSERVING BIODIVERSITY

Conserving our natural spaces and reducing their degradation is essential for mitigating air pollution. India has lost 3.8% of its moderately dense forest in the last decade, including approximately 18% of forests from six of the north-eastern states. Recorded forest area in tribal districts, which are home to about 60% of India's forests, is decreasing as well. We need to conserve forests, wetlands, rivers, mountains and coastal ecosystems and maintain their diversity for maximum benefits of pollution control and temperature regulation.



Preventing the loss and degradation of forests and restoration of degraded forests through large scale afforestation programmes with native tree species is necessary. We need to take care that new plantations are not monocultures and that they encourage the widest range of plant and animal biodiversity possible. This ensures the health and resilience of forests against natural calamities and anthropogenic pressures.

CREATING GREEN SPACES

Urban forests and green roofs need to be included as key strategies for reducing pollution in urban areas. Many trees are effective for trapping and absorbing air pollutants and act as a sink to several air pollutants. The space dedicated to urban forests and green areas in cities must be increased.



SHIFTING TO CLEAN AND SMART TRANSPORTATION

Transportation accounts for one third of the total air pollution in India.

India was one of the first countries to pledge the phasing out of non-electric vehicles, and has set a target of 15-16

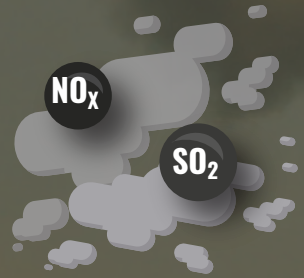
million e-vehicles by 2020. However, there were only 0.28 million e-vehicles in India till May 2019. India also needs to shift freight transport from road to lower-emission modes such as rail, inland waterways, and coastal shipping. Improved public transport, better non-motorised transport infrastructure (NMT) to encourage cycling and walking, and a greater shift towards cleaner fuels such as CNG are essential to ensure better air quality.



Among the Indian trees, the **Neem tree is an effective and efficient pollutant remover** as it acts as a natural air filter trapping dust particles and absorbing gaseous pollutants. **Peepal, Saptaparni, Jamun, Devdar and Champa** are also good for pollution control.

MINIMISING INDUSTRIAL POLLUTION

Reducing industrial emissions is a must to improve our air quality. Stringent emission standards need to be implemented to control gaseous pollutants (nitrogen oxide, sulphur dioxide) and fine particulate emissions from power plants and big industries. Strict monitoring and maintenance of electrostatic precipitators (ESPs) and other equipment for efficient tail pipe controls in industries should be ensured. Adopting cleaner and efficient production technologies to begin with can solve the problem before it starts.



PROCESSING AGRICULTURAL WASTE

To prevent the seasonal and large scale burning of agricultural waste, business models need to be developed for their collection, transport, processing, storage and use in industries. Agriculture residues and farm manure can be converted to electricity for rural power and into biomass pellets for fuel efficient devices. This reduces household air pollution, which is a significant problem in rural areas.



MANAGING MUNICIPAL SOLID WASTE

A complete ban should be enforced on burning municipal waste with strict penalties. Methane is a potent greenhouse gas (GHG) formed in landfills, sewage treatment facilities, and livestock farms. These facilities should be mandated to install methane recovery systems and its subsequent use as an energy source. Segregation of waste at the source, composting of biodegradable waste, and recycling should be adopted as mainstream strategies of waste management in all cities.



SCALING UP AFFORESTATION AND ECOSYSTEM RESTORATION SCHEMES

Central schemes like National Afforestation Programme (NAP), National Mission for a Green India (GIM) and Forest Fire Prevention & Management (FFPM) need to be scaled up and decentralised. Allocations need to be enhanced along with involvement of panchayats and other local village level institutions for decision making and taking responsibility of such schemes. State schemes like Harita haram, Janta van yojana and Van bandhu yojana need to be replicated and adapted to include restoration of all ecosystems like grasslands and not just forests.

INFLUENCING POLICY

Innovative approaches and action are both required to reduce air pollution and the effects of pollutants on respiratory health. Public policies need to mandate and incentivise engineering solutions that drastically reduce emissions from industries and vehicles.

Mainstreaming e-mobility is of utmost importance to reduce our dependence on fossil fuels for transport. There is also a need to develop mechanisms for improved urban planning, sustainable pathways for industrialisation and reducing traffic congestion. Formal recognition and tenurial security for tribal and local communities dependant on forest resources to incentivise conservation and sustainable resource use will also enable healthy ecosystems and enhance their services.



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LINK BETWEEN HUMAN HEALTH, AIR POLLUTION AND COVID-19

The global pandemic of COVID-19 is showing us clear linkages between health and nature, and detrimental consequences of nature loss and degradation. New research shows that long-term exposure to air pollution may be “one of the most important contributors to fatality caused by the COVID-19 virus” around the world. The study found that 78% of deaths had occurred in just five regions in northern Italy and Spain. These regions have the highest concentrations of nitrogen dioxide (NO₂)- a major air pollutant which weakens respiratory systems and makes people more susceptible to COVID-19.

In many cities, the lockdown due to COVID-19 has led to cleaner air. The Central Pollution Control Board has reported a marked improvement in air quality in 85 Indian cities. This is predominantly due to reduced burning of fossil fuels in vehicles, no emissions from industries and the absence of dust emanating from construction sites.

We need to learn lessons from this situation and move towards a new normal which avoids wasteful consumption and adopts nature positive lifestyles.

Controlling air pollution also helps reduce greenhouse gas emissions. Healthy forests play an additional role of heat sinks and store carbon from the atmosphere, thereby resulting in effective climate change mitigation. Nature loss and poor air quality affect all of us. The decision and action to reverse this loss is in our hands, and can help future generations.