

Environment



It is everyone's experience, when two persons knowing each other meet or when two persons meet for the 1st time, their conversation begins with the enquiry of air-water. But are we really serious about our air and water? A phrase of 'talking about air and water' has become very common. It means as wasting time or talking about non-important things. The air is considered as the least important. This shows how careless we are about a thing which is most important for living. Perhaps we don't have to pay money for air. It easily and unknowingly fulfils our need of life. Therefore, we are so careless about it. In future, we will know the real price and value of air when we will have to take oxygen cylinders with us. But, by then it will be too late. The serious problem of air-pollution is on our door-steps. The time to think about it urgently has come.

The basic needs of a human being are food, clothing and shelter. There is no doubt about it. Food includes water

also. How long a person can live without food? There is a tradition of fasting in all the religions. People from different parts of the world observe fast from a day to month or more. Hunger strike unto death is done for some social and political reasons. In short, a person can live without food for some time. Generally, it is assumed that a person can live without food for 3 months. It is also assumed that a person can live without water for 7 or 8 days. In the process of development somewhere man started wearing clothes, from bark of the trees to the yarn of thread. This might have happened some thousand years. Before that, man lived without clothes. The predecessor of man lived in natural state. Even today there are some primitive people on the earth who wear the least of clothes. Besides man, no other living thing needs clothes. The 3rd basic need is shelter. The primitive man looked for shelter in the mountains, caves and valleys. It was his basic need for self-protection. Man started farming and the settlements came into existence. Later he started building houses. Today this journey has reached to apartments, row-houses and bungalows. Basically, the need was only of shelter. One was contented with natural shelter. In short, a person can live for some time without food and water, even without clothes. One doesn't die immediately without these things. But can a person live without air?

It is said that there is a difference of 'one breath' in living and dying. It is true, breathing stopped means a person ceases to live. As we go high and high from the sea level, the air becomes less and less and you need an oxygen cylinder for breathing. Any mountaineer can tell you this. In a crowd or stampede, we feel suffocated. A person drowns and dies in water because he doesn't get oxygen. Oxygen is the life of all living things including human

beings. It is the basic need, being careless about air, is very serious.

We don't see the air but it is around us. We come to know about it through gentle breeze or stormy wind. But when there are no winds, we become restless. The process of breathing is so basic and natural that we are unaware of it. Our breathing is the proof of the existence of air. Air is everywhere on the earth. It is free. Man has distributed land and even the sea, but is unable to distribute air. Recently, a volcano had erupted in England but the clouds of ashes had reached the shores of India which means, no one has control on air. 'To take care of air' is the duty of everyone on the earth. Because man is mainly responsible for 'air pollution', the air pollution can spread everywhere like the volcano clouds. We should remember that the pollution at one place can affect the atmosphere, plants, and animals of another place.

Air has 78% Nitrogen, 20% Oxygen, the left 1% is Argon, Carbon dioxide and other gases. There is 1% water vapour in the air. Oxygen in the air is $\frac{1}{5}$ th of it. Mixing of chemicals, biological and other particles in the air which is harmful to human beings and other living things is called 'air-pollution'. It can be naturally through, the Sulphur dioxide, spreading in the air due to eruption of volcano, the Methane gas produced through the urine and excreta of living things etc. But today human beings are mainly responsible for air pollution. We are surrounded by pollution.

The main factors polluting air are sulphur dioxide, nitrogen oxide, carbon monoxide and carbon dioxide. These factors are emitted through the combustion of coal, wood, natural gas and petroleum and due to increase in the

temperature due to their combustion. The main causes responsible for air pollution is increasing industrialization, increasing use of fuels like natural gas, petroleum products and deforestation on a large scale.

The industrial revolution – began in 17th century. The goods were made with the help of machines. It increased the production capacity. More goods were produced in less time. It became necessary to find new markets for the produced goods, through this, the colonial system was established. Vehicles like motor cars; railways were invented for the speedy transport of the produced goods. Network of roads and railways was erected. These vehicles started running on steam (coal) first and then on petrol. In a span of 300 years the industrialization created emission from factories and vehicles, the quantity of carbon in the air increased and air got polluted on a large scale. This process now has become very speedy, according to a statistic, India ranks 4th in the emission of carbon. China is on the top, with a share in carbon emission 21.5%, America ranks 2nd with a share of 20.2%. These two countries together emit more than 40% of the total carbon. Russia stands 3rd with a share of 5.5%. After that comes India. India's share in carbon emission is nearly 5%. In 1st ten countries, apart from developing countries like India and China, all other are developed countries like America, Russia, Japan, Germany, England, Canada, South Korea and Italy. The most polluted city on earth is Gurugram, a financial and industrial hub of nearly 1 million people situated about 30 kilometres southwest of New Delhi. There, average air pollution levels in 2018 were more than 13 times the level permitted under WHO guidelines, although air quality had actually improved slightly since the previous year.

India Has The Most Polluted Cities On Earth

Average level of particulate matter (PM 2.5) pollution in 2018



@StatistaCharts

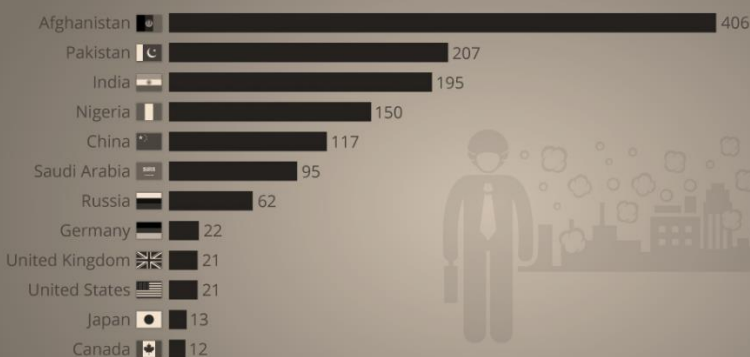
Source: IQAir AirVisual 2018 World Air Quality Report & Greenpeace

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It will be worthwhile to understand as to how many deaths that occur every year due to air pollution at the global level. The following figure focuses on this aspect.

Deaths From Air Pollution Worldwide

Age-standardized deaths per 100,000 people attributable to air pollution (2016)*



@StatistaCharts

* Selected countries. Age-standardized takes into account deaths per 100,000 people and standardizes based on the age structure of the population. It therefore corrects for population size and age demographics.

Source: Health Effects Institute: State of Global Air 2018

statista

Source: <https://www.weforum.org/agenda/2019/03/7-of-the-world-s-10-most-polluted-cities-are-in-india/>

Pollution due to vehicles has become a serious problem. In a city like Pune, there is a gigantic growth, in the number of vehicles, specially 2 and 3 wheelers. The number of four wheelers and buses also are increasing. Pune once the ideal city for weather, has now become the most polluted city. Apart from the smoke of the vehicles, the smoke emitted by the factories around the city also adds to the pollution. This city has experienced the fast spread of the epidemic disease like Swine-flu. The virus is spread through air. 2-3 years ago, the virus of the epidemic swine flu was spread in America. Pune was the city where the 1st patient of swine flu was noticed. The 1st death of the disease also was in Pune. The city got scared as the flue started, spreading fast. The whole country was scared. This is an example of how dangerous air pollution can be. Do we learn from this?

Pune has notched up another distinction: The total number of vehicles here has surpassed the human population, considered a first for any urban area in the country, officials said.

While the population stands at approximately 3.5 million (35 lakh), the number of registered vehicles for the area is now 3.62 million (36.2 lakh) under the Regional Traffic Office MH-12, said RTO Chief Babasahen Ajri.

"Till March 31, 2018, the RTO has notched an increase of over 280,000 vehicles, with two-wheelers still enjoying the lion's share. This takes the figure of registered vehicles in the city to 36.27 lakh, from 33.37 lakh the previous year (2016-2017)," Ajri told IANS.

Compared with 2017, the number of four-wheelers registered increased from 5.89 lakh to 6.45 lakh in 2018

and the number of registered two-wheelers shot up from 24.97 lakh to 27.03 lakh now, he added.

By implication, this denotes at least one vehicle owned per family in the city, and in many cases, a combination of either a four-wheeler and two-wheeler or multiple two-wheelers.

In percentage terms, the registration of four-wheelers in 2018 notched a growth of 9.57 per cent and two-wheelers by 8.24 per cent over 2017.

Consequently, Ajri said, that Pune RTO's revenues overshot the target of Rs 862.32 crore by 118.38 per cent to net Rs 1,021.56 crore.

"We had overshot the target even in 2017 by 130.31 per cent, netting Rs 783.93 crore, with a growth of Rs. 237.63 crore then," Ajri said.

In 2018, the highest growth of 25 per cent was seen in the taxi-cab segment with a total of 28,344 cabs registered against 22,696 in 2016-2017.

Ajri attributed this growth to the increased acceptance of cabs as a mode of conveyance over self-owned or self-driven vehicles by the growing industrial, IT, educational sectors, and upcoming residential complexes in and around Pune, among others.¹

Industrialization started in India, since British era. But it was a slow process. A number of textile mills were started in Mumbai. Production of chemicals, steel,

¹<https://www.indiatoday.in/auto/auto-news/story/vehicles-figure-in-pune-overtakes-human-population-1206311-2018-04-06>

fertilizers, machinery were on a small scale. India was an agricultural country then. Today also, it is known by the same name, the number of industries has increased after independence. The goods of all types are produced in India like Chemicals, Medicines, Textile, Fertilizers, Machinery, Paper, Automobile, Electric and Electronic goods etc. It is a sign of progress in India. But due to growing industrialization air and water are getting polluted on a large scale and the existence of man and other living things are in danger. The waste water in the production process is let into the natural sources of water like rivers and streams. Due to this, the sources become polluted. Similarly, the air is getting polluted due to smoke, emitted from the factories. The city of Bhopal in India has experienced the hazardous effects of poisonous gas leakage from the factories. In 1984, due to gas leakage from Union Carbide, thousands lost their life. Many were disabled. The gas leakage had adverse effect on new born babies as well as the foetus in mother's womb and was born with some ailments or had some physical disabilities. The historical heritage of India – Taj Mahal is not spared from pollution. This beautiful structure which is the symbol of Shahajahan's love is surrounded by industries. Due to the emission of gases and smoke from these factories, this structure has stains on it. Now preventive measures are being taken against it.

Cases are filed in high court and Supreme Court against air pollution. The issue of notices for the pollution, putting restrictions on those responsible for it, taking legal action etc. are not the answer. It is like putting off the fire after it spreads. Instead of putting such restrictions, all the factors of the society should consider the seriousness of the problem; they should change their attitude about the air pollution and should behave accordingly for the welfare of

mankind. Today everywhere in cities, the pollution level is displayed. The per cent of sulphur dioxide, Carbon-monoxide, nitrous oxide is measured to show if it is above or below the level of danger. But this question won't be solved just by informing and giving status of pollution. Some strong measures should be taken.

Climate change is a threat to regional peace and security

Climate Change and its impact now hold the world's undivided attention. The Climate Change talks to be held in Paris 2015 shall be a defining moment as nations will have to take a decisive step whether they would continue on the self-destructive path that they are now moving on or are ready to take the painful and serious commitment to cut down on their Green House emissions and be ready to take on the ensuing responsibility.

The Fifth report of the United Nations backed inter-Governmental Panel on Climate Change ushers in the above exigency as it contains more bad news not just for the global environment but also for India.

The biggest challenge lies in ensuring that the rise in temperature is contained to two degree Celsius, which is essential to prevent irreversible damage to global climate and its perilous economic and health consequences.

Air Pollution and Climate Change are also inextricably linked. Across the EU more than 4,00,000 people died prematurely in 2010 from air pollution. According to the European Commission, in U.K alone the figures reach up to 29,000 early deaths every year.

Air pollution data released recently by the World Health Organization show that 13 of the world's 20 most polluted cities are in India and that the dirtiest air on this planet is in Delhi.

Climate change is one of those problems that the global society faces, which has the potential to make life on planet Earth an impossible task.

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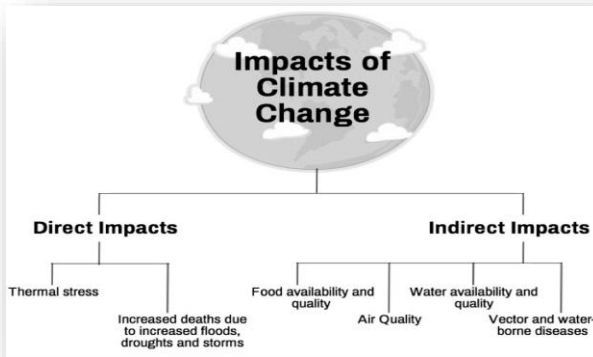
Climate change in itself is a natural process that is supposed to take place over really long intervals of time.

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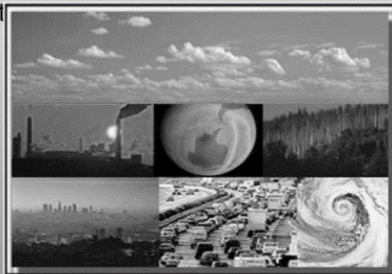
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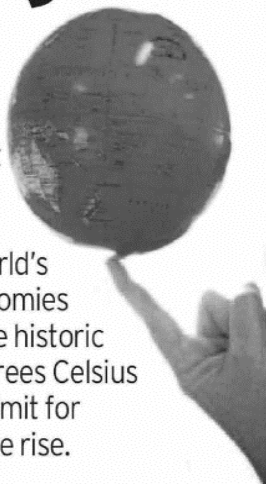
Impacts of Air pollution on Environment

- Acid Rain
- Global warming and Green House effects
- Ozone Layer Depletion
- Smog

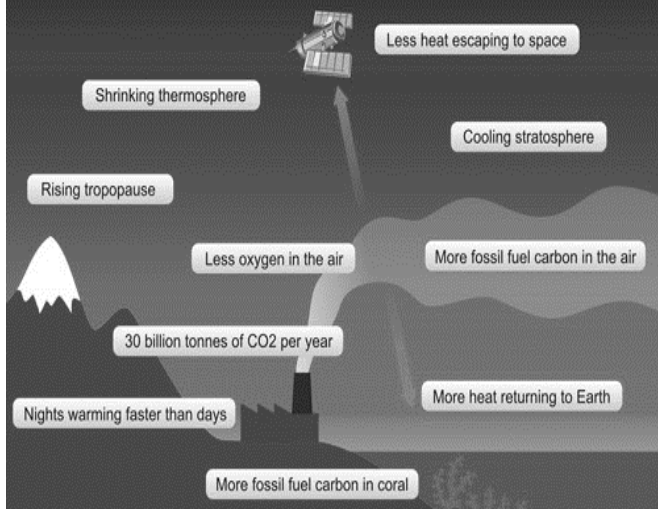


2 degrees

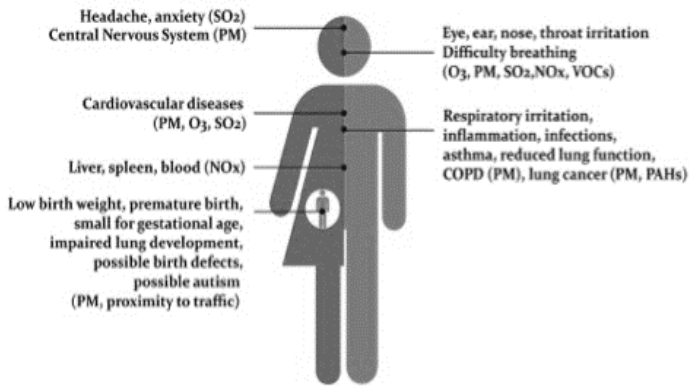
That's the amount the planet will be allowed to warm. Leaders of the world's eight richest economies have agreed to the historic deal setting 2 degrees Celsius as the maximum limit for global temperature rise.



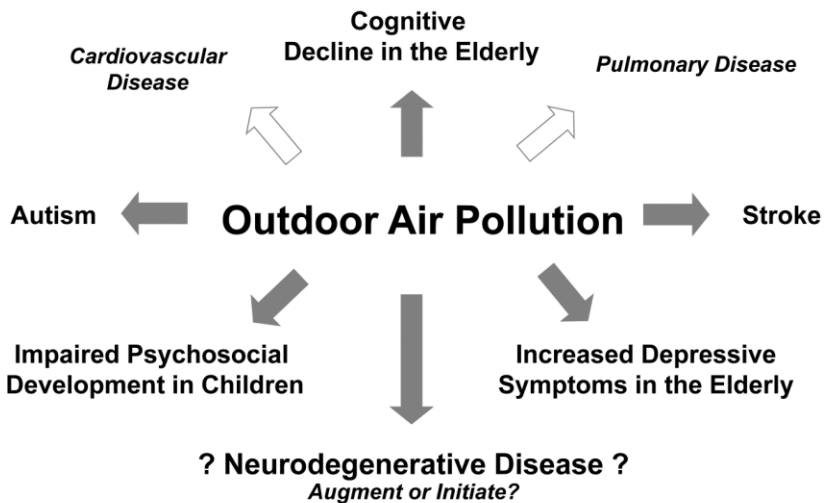
10 Indicators of a Human Fingerprint on Climate Change



Health Effects of Air Pollution



Impact of Air Pollutants on Human Health: The Central Nervous System



Recently, there are discussions about green-house gases and green house effects. Gases like carbon-dioxide, carbon monoxide are included in greenhouse gases. When coal, wood, natural gas, petroleum products are burnt

incompletely, carbon monoxide is produced. Similarly, due to their combustion and high temperature, gases like carbon-dioxide are formed. Due to these gases in the atmosphere, the temperature rises. In short air pollution is responsible for global warming. Besides this, it is found that the ozone layer in the atmosphere is getting holes due to greenhouse gases. This ozone layer is very important. The harmful ultra violet rays of the sun are stopped by the ozone layer and thus it protects the life and nature on the earth. But due to the holes these rays directly enter the atmosphere. Some of the holes in the ozone layer are of the size as Sahara Desert. As a result, the health of man and other living things is endangered. These rays are responsible for cancer and other diseases of skin. These are the consequences of human mistakes. Whatever may be the gravity of effects, every progressing country has to face the harmful effects.

The increasing weapons and missiles competition on the global level is also responsible for the increasing pollution. America is leading in the production of weapons. This industry involves a large amount of capital and man power. Naturally it is necessary to keep this market alive, so terrorism is encouraged. Along with controversial weapons, nuclear, chemical and biological weapons are being produced. These are strictly banned for the production and use. The two atom bombs on Japan during 2nd world war had shown the destructive powers of these weapons. After that strict restrictions were imposed on the spread of nuclear weapons. Even then, countries like America, Russia, Britain, France, Germany, India, and Pakistan have nuclear weapons. There is a doubt that Iran, Israel and North Korea also have nuclear weapons. The radiation due to nuclear explosion is detrimental to the very existence of living things. It causes serious diseases

like cancer and physical disabilities. The loss due to chemical weapons is also beyond cure. The Ex-President of Iraq, Saddam Husain, had used chemical weapons against the minority tribes of Kurds in Iraq. Biological weapons are even more dangerous. They spread the virus and germs hazardous to man in the air and people can be killed due to epidemics. Some years ago, some people tried to spread the germs of anthrax through a powder in the air. Hitler made use of gas chambers in the 2nd world war. Lakhs of Jews were killed by locking them up in gas chambers. These hazardous deeds of man not only pollute the air but also endanger the very existence.

We have to think seriously of one more factor adding to air pollution. Spaceships are sent to the space. Missiles carrying satellites also are sent to the space. The purpose is for space research and communication. These ships and missiles are sent to the space, by cracking the layer of air (atmosphere). Similarly, when the satellites take message and telecast them, radio-waves go through the air. By the usage of communication channels like radio, T.V., internet, mobile, there has been a lot of pollution due to radio-active waves. This pollution is not seen in the air. There is no adequate research on it. Hence its consequences are also not known today.

We cannot ignore air. We should not be careless about air pollution. There is no use digging the well after becoming thirsty. We will have no way to save ourselves, when the pollution has disastrous impact. Therefore, we must take care of environment today itself.

We have learnt about the direction of wind flow in the schools. We know that land gets heated quickly and cools quickly. Water gets heated slowly and cools slowly.

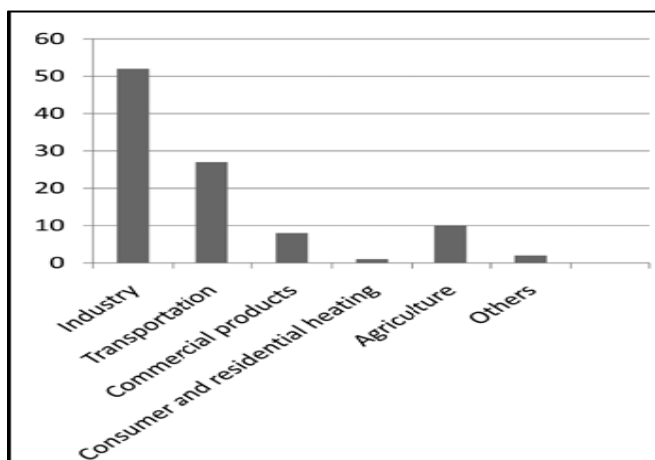
During the day, the land gets heated due to the heat of the sun. This hot air goes upward. The air on the sea is comparatively cool as the water gets heated slowly, so winds flow from sea to the land. The same process is reversed in night. At night the winds blow from land to the sea. The winds coming from the sea bring clouds. Let us know how the clouds are formed. The sea water becomes hot and turns into vapour. This vapour goes up and gets cooled. Thus, the clouds are formed, which have vapour. This condensed vapour falls on the earth in the form of rain.

The trees, greenery have important role in the cycle. On the mountain tops, valleys, the air is cool due to thick trees. Along with the winds, the clouds move up to the mountains and are stopped there. It rains there. Today, mountain tops, hills have become barren due to excessive deforestation. Trees have disappeared. Therefore, the rainfall has become less. Droughts are common. When it rains, the drops fall through air and the dust and other particles come on land. The air is washed by rain it gets clean and pure. Today due to irregularity in rain, air is not cleaned. It is related to air pollution. Secondly, due to trees, plants, the air would be cool in hills and valleys. Hence there would be good ventilation of air in the villages, towns near jungles, hills valleys - because the winds flow from jungles to the land. Now as the trees have become less, there is no ventilation of air in towns and villages. As a result, the weather has become hot and dry.

Now we know the consequences of the industrial development. We are stopping the natural process of purification of air by cutting down the forests. On the other side, we are causing heavy losses to ourselves by polluting the air due to industrialization and excessive combustion

of petroleum products. Air is a mixture and not a compound, which can be changed often. The losses due to air pollution are permanent. Hence, we have no alternative but to take utmost care of the air and the atmosphere. What should we do for this?

Sources of emission of air pollutions



Trees, flora and fauna are the natural lungs. They help in keeping the desirable level of oxygen. During the day, plants take in carbon-di-oxide and give out oxygen. Similarly, at night, they take oxygen and give out carbon-dioxide. We feel fresh, when we sleep under a tree during the day time because we get pure oxygen. During daytime, plants take in carbon-di-oxide because with its help, the process of photo synthesis takes place. Man, and other living things take in oxygen and give out carbon-di-oxide. Hence the decreasing level of oxygen is maintained through this double-breathing process. Therefore, the cutting of trees directly affects the level of oxygen, which is

essential for our breathing. Hence it is our duty to keep these natural lungs alive.

We can plant trees and look after them. Israel is a small country with very less rainfall, and surrounded by desert land. But still it has done farming with great efforts. They have made the terraces of the buildings green with plants. We can also prepare soil beds on the terrace of our building and can grow different fruit trees, vegetables or just grow greenery. Like this, we can create a green covering on our building. Due to this, the Oxygen level in the surrounding will be maintained and we can get Oxygen in pure form. Besides we can grow fruits and vegetables, thereby decreasing the burden or stress on agriculture.

There are many empty or vacant plots in the cities. Planting trees, making lawns or planting bushes can be done publicly and collectively. Similarly, trees should be planted in the dividers - between the roads. We can plant trees in the vacant places of a society or residential complex. The trees in a society can be watered using sewage water instead of draining the water into rivers which in turn pollutes the river. Tree plantation can be done at the roadsides in cities and highways. Trees can also be planted even on both sides of railway lines.

Besides, trees should be planted on mountains. If bunds are built in small valleys near hills, water can be stored there. This will give rise to good growth of trees on hills. Local people can get employment through - plantation of fruit trees and medicinal herbs. The programme of building small bunds can give rise to employment opportunities. These are the simple ways, the common people can look for, for the preservation of the natural lungs of nature i.e. trees.

If the employees of govt., semi-govt.-offices and private sectors keep a day reserved for the nature's growth programme, it can be of great use. On that day, instead of doing regular work, they will spend the time in looking after and caring for the trees, plants, lawns etc. in their surroundings. They will bring new plants, plant new trees, do landscaping. Thus, along with their offices, they can also participate in making the places like grounds, roads, highways green.

We should emphasize the importance of trees, air, and environment to the children right from the childhood. It is said in 'Vedas' that, 'One tree is equal to hundred sons. We should give information to the children, 'how much oxygen do we breathe in and how much carbon-dioxide do we breathe out? How trees are important for the balance of air and environment.' The scientific, educational, historical stories telling the importance of trees should be included in the school syllabus. Children are tomorrow's citizens. They should be told that the protection of environment is necessary for their future. They should be made aware. The technique of planting and growing trees and their management etc. should be included in their school education. So that tomorrow's generation would get ready to convert wrong things into right.

While I was writing this chapter a very serious news concerning the climate change came to my notice which expresses the gravity of the global emissions and impact of climate change. The news summarizes the risks that we all are heading.

“UN Climate Action Summit 2019”

Global emissions are reaching record levels and show no sign of peaking. The last four years were the four hottest on record, and winter temperatures in the Arctic have risen by 3°C since 1990. Sea levels are rising, coral reefs are dying, and we are starting to see the life-threatening impact of climate change on health, through air pollution, heat waves and risks to food security.

The impacts of climate change are being felt everywhere and are having very real consequences on people’s lives. Climate change is disrupting national economies, costing us dearly today and even more tomorrow. But there is a growing recognition that affordable, scalable solutions are available now that will enable us all to leapfrog to cleaner, more resilient economies.

The latest analysis shows that if we act now, we can reduce carbon emissions within 12 years and hold the increase in the global average temperature to well below 2°C and even, as asked by the latest science, to 1.5°C above pre-industrial levels.

Thankfully, we have the Paris Agreement – a visionary, viable, forward-looking policy framework that sets out exactly what needs to be done to stop climate disruption and reverse its impact. But the agreement itself is meaningless without ambitious action.

UN Secretary-General António Guterres is calling on all leaders to come to New York on 23 September with concrete, realistic plans to enhance their nationally determined contributions by 2020, in line with reducing

greenhouse gas emissions by 45 per cent over the next decade, and to net zero emissions by 2050.

“I want to hear about how we are going to stop the increase in emissions by 2020, and dramatically reduce emissions to reach net-zero emissions by mid-century”

UN Secretary-General is calling on all leaders to come to New York on 23 September with concrete, realistic plans to enhance their nationally determined contributions by 2020, in line with reducing greenhouse gas emissions by 45 per cent over the next decade, and to net zero emissions by 2050 - António Guterres - UN Secretary-General

So read the writing on the wall and be wise. Take all possible actions to combat this evil of emissions. Everyone has to participate for better tomorrow.

By the time I was writing this book, Climate Central – an organization based in New York in its article in Nature Communication after studying the climatic changes, stated that due to global warming it is feared that by 2050 Mumbai (India) will have a serious problem of increase in the sea level which will affect the settlements on the sea shore. According to this report it is likely that the sea level will increase by two to seven feet. The report further states, that in the world by 2100, 20 crore houses will be under water level and permanent within the range of permanent tide.



Quotes

“Earth provides enough to satisfy every man’s needs, but not every man’s greed”

- Mahatma Gandhi

“A nation that destroys its soil, destroys itself. Forests are the lungs of our land, purifying the air and giving fresh strength to our people.”

– Franklin D. Roosevelt

“Tap water is, on average, 500 times cheaper than bottled water, boycott the bottle water.”

“It is not an investment if it is destroying the planet”

– Vandana Shiva

“Destruction is a man's will,
Nevertheless, Prevention is also a man's will,
It's a man's choice to choose between Destruction and Prevention. :)”

– Babu Rajan

“Environmental pollution is an incurable disease. It can only be prevented.”

-Barry Commoner