



# Air

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 the different parts of the world keep 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 in 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 content 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-di-oxide and other gases. There is 1% water vapour in the air. Oxygen in the air is 1/5th 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 things 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 statistics, 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. Here is a table, which shows the increasing pollution in the main cities of India and it gives the idea of deaths due to air pollution.

## Increase in pollution

The increased pollution in the main cities of India from 2002 to 2010

No.	City	Increase in Pollution (%)
1.	Bengaluru	34
2.	Pune	27
3.	Hyderabad	26.8
4.	Nagpur	22
5.	Mumbai	18
6.	Chennai	13
7.	Surat	12.5
8.	Ahmedabad	12
9.	Kolkata	11.5
10.	Delhi	4.2

## 2) The condition of air pollution in most polluted cities

	Delhi	Mumbai	Bengaluru	Pune	Chennai	Kanpur
Dust on the road	50%	29%	22%	65%	74%	16%
Industrial smoke	23%	27%	12%	10%	16%	32%
Smoke of vehicles	7%	6%	40%	17%	3%	20%
Other	20%	38%	26%	18%	7%	32%

## 3) Daily use of fuels in India (as per ten lakh litres)

	2009-10	2010-2011	2011-2012
Petrol	49	54	57
Diesel	148	161	175

According to the report of Centre for environment Research, Delhi (C.S.E.)

- The deaths due to air pollution increased six times in thirteen years from 2000 to 2012.
- The number of death due to pollution were nearly 1 lakh in 2000.
- Air pollution is the 5th main reason for the deaths 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?

Industrialization started in India, since British era. But it was a slow process. A number of textile mills were started in Mumbai. Other productions like chemicals, steel, 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 effects on new born babies as well as the foetus in mother's womb and were 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 are displayed. The percent 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.

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.

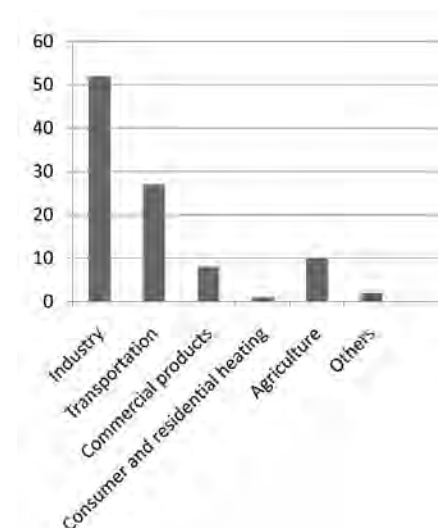
The trees, greenery have important role in the cycle. On the mountain tops, valleys, the air is cool due to thick trees. Along with the




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 flows 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



Industry - 52%, Transportation - 27%, Commercial products - 8%, Consumer and residential heating 1%, Agriculture - 10% Others - 2%



*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.*

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-di-oxide. 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 breath in and how much carbon-dioxide do we breath 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.

