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A STUDY ON THE EFFECTS OF AIR POLLUTION ON HUMAN HEALTH

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Abstract: In this paper we are presenting the Effects of Air Pollution on Human Health. Polluted air causes respiratory diseases such as bronchitis, bilinosis, sore throat, pneumonia, lung cancer, etc. Apart from respiratory diseases, excess of sulfur-di-oxide and nitrogen-di-oxide in the air causes cancer, heart disease, diabetes etc. the five main effects of air pollution. The effects are:- 1. Effect on Human Health 2. Effect on Plant 3. Effect on Fauna and a Few Others. Air pollution affects in various ways. But the effect of air pollution is so widespread that its specific mention is necessary. Air pollution not only affects human beings but also on other aspects of climate and environment along with flora and other fauna.

Keywords: Air pollution, flora, fauna, Human Health, climate and environment etc.

Pollution

The pollution or stigma in the cover that surrounds the atmosphere is called environmental pollution. Pollution is generally caused by human activities. With regard to pollution, in 1966, the Science Advisory Committee of NCI has given the definition as follows -

"Pollution is any disturbance in the physical, chemical or biological properties of air, water or land that causes or is likely to cause damage to human and other life, industrial processes, living conditions, and cultural assets."[1]

In 1970, the dmevbeenemje pdvitunjpavad vahadpemjapvad (DW) of NCC defines pollution as “the production of waste or rubbish at all stages of production and consumption of goods or services”. These wastes become pollutants or give rise to a kind of environmental problem. They harm the atmosphere, oceans and terrestrial environment."[2]

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In 1972, Dixon wrote in relation to pollution that "Pollution includes all those desired and unwelcome actions of man and his domestic animals and the effects and consequences resulting from them, which are their ability to get pleasure and full benefit from the environment" reduce it."[3]

According to Lord Kennett, “Pollution is the presence of those elements or energy in the environment which have been produced unintentionally by man, whose purpose of production has now ended, who have escaped suddenly.

In this way, when there is so much change in nature due to human's desired or unwilling actions, that it exceeds the tolerance power of the ecosystem, then due to excessive degradation in the quality of the environment, far-reaching harmful effects on human society begin to occur.

Most of the people are of the opinion that environmental pollution is the result of urbanization, indiscriminate exploitation of natural resources for industrial and technological advancement, increased rate of exchange of matter and energy, urban sewer and continuous increase in production of electrified consumer goods. Often a man takes birth in a specific type of environment and lives in it for life. Thus, by environmental pollution, we mean the loss in the quality of all physical, non-material, living and non-living and external elements around man. Decreasing quality of environment can be painful for human beings. Environmental pollution is explained by the following sources -

1. Natural Sources of Pollution
2. Man-made sources

1. Natural sources of pollution -

Under this type of pollution, pollutants such as volcanic ash and dust, substances brought to the ground through cracks caused by seismic events, water from flooded areas, sediments generated by soil erosion, etc, have been included.

2. Man-made sources -

The following sources are responsible for this type of pollution -

(A) Industrial sources (B) Agricultural sources (C) Population sources

Most of the pollutants are generated from industrial and urban areas.

The pollutants released from industrial sources are as follows:

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(i) Nitrogen oxides, sulfur dioxide, carbon monoxide, hydro-carbons and other toxic gases are prominent as gaseous pollutants.

(ii) Solid pollutants.

(iii) Dissolved and suspended solids.

(iv) Waste water heat etc. mixed with many types of harmful chemicals.

- **The following pollutants are generated from urban sources:**

Sewer water, solid waste material, garbage, gases emitted from automatic vehicles, various types of pollutants coming out of chimneys of factories, dirty water flowing through dirty drains etc.

- **The major among the pollutants borne from agro-source is :**

Chemical fertilizers, pesticides, herbicides, pesticides, synthetic chemicals etc. Human population is the most important source of environmental pollution because all types of human-caused pollution are generated due to human activities. Apart from this, poverty and unemployment are also a major source of pollution.

Due to pollution, it is natural to have disorder and depression in the natural balance of the ecosystem. These are substances that directly and indirectly affect human health and natural resources. There is such a system in nature that it absorbs the changes caused by natural causes, but man is not yet able to make a permanent arrangement for the disposal of the pollutants generated by him.

Pollutants are classified on the basis of their characteristics as follows:

(a) On the basis of visibility -

Such pollutants are included which are visible, which are called visible pollutants. On the contrary, such pollutants which are not clearly visible but affect them more are called invisible pollutants. Visible pollutants that can be seen with the eyes include smoke, dust, sewer water, garbage, excreta and industrial waste, etc. are examples of pollutants. On the contrary, those pollutants which are not visible to the eyes such as the presence of bacteria and toxic chemicals in air, water and soil are pollutants.

(b) On the basis of origin -

These pollutants are generated as a result of natural activities. These pollutants have harmful effects on the environment and all the animals as well as the vegetation. Among these pollutants,

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mainly volcanic ash, dust, fog particles, sand particles etc. are prominent. In addition to these pollutants, human-made pollutants are also included. These pollutants are mainly garbage, sewer water, smoke, excreta, industrial waste, pesticides, toxic gases emitted from vehicles, toxic gases coming out with smoke from chimneys of factories.

(c) On the basis of factors-

Mainly physical, cultural and biological pollutants have been included as these pollutants. Physical pollutants include all types of gaseous, solid and liquid pollutants caused by man. Cultural pollutants include population explosion, poverty, prosperity, cultural and educational backwardness, robbery, adultery, crime. Whereas locusts under biological pollutants, the abundance of nutrients in aquatic parts has been included.

(d) On the basis of specification -

On the basis of the specificity of the pollutants, they are divided into air pollutants, water pollutants and terrestrial pollutants respectively. Air pollutants include sulfur dioxide (SO_2), nitrogen oxides (NO_2), carbon dioxide (CO_2), carbon monoxide (CO), hydrocarbons (HC) (Pb), lead (H_2SO_4), sulfuric acid (O_3), ozone, (As) arsenic, (Cd) cadmium, fluoride (F) , benzene (C_6H_6), mercury (Hg), hydrogen chloride (HCL), formaldehyde (HcHo), silicon tetrafluoride (SF_4), chlorofluorocarbon (cfc), and hydroxyl radicals (HO), ammonia (NH_3), asbestos and aldehyde etc. In addition to these pollutants, dissolved and suspended solids in water, chlorine ions, sodium ions, calcium ions, magnesium ions, insecticides and pesticides and D.D.T. Chemical residues, toxic substances such as lead, mercury cadmium and radioactive waste materials are also included. Similarly, terrestrial pollutants, including excreta, waste, pesticides, insecticides, chemical fertilizers, machinery equipment and radioactive elements generated by humans and animals are also included.

(E) On the basis of biological decaying potential -

These types of pollutants mainly include biodegradable and non-biodegradable pollutants. Biodegradable pollutants include excreta, garbage, garbage etc. These pollutants are taken up by micro-organisms in the form of their food. The amount of decaying pollutants in the environment should be as much as the micro-organisms can decompose them. If the pollutant elements are collected in excess of the decaying capacity of the bio-microorganisms, then the environment starts

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getting polluted and the harmful effects on human health are started due to the effect of decaying pollutants. Non-degradable pollutants are included in the second type of pollutants, which include elements that are not able to reduce or dissociate by micro-organisms. Such as polythene, aluminum, iron, mercury, plastic, copper, manganese, cadmium, phenol, lead, hydrocarbons, are such non-degradable pollutants.

Air Pollution -

On studying the different types of pollution, we find that the biggest problem in the present time has become "air pollution". Air is an important component in transporting pollution from one place to another. As it is clear that "air" is present in all mediums, therefore its effect is omnipresent. Due to this nature of air, pollution moves easily in different mediums which directly and indirectly affect all living organisms and plants.

When the presence of unwanted elements and dust particles in the air exceeds a certain amount, they are not absorbed by the ecosystem. Due to which it gives birth to air pollution. The entire atmosphere is an important part of the environment, which provides pure air to human life and other animals along with plants and trees. Human life cannot even be imagined in places where there is absence of air. According to another research survey, a person breathes an average of 20 thousand times throughout the day, in which he uses 35 pounds of air. If this air is not pure, then instead of giving life, it starts taking life. Due to air pollution, such substances are produced which have harmful effects on various organs of the human being. These pollutants include sulfur dioxide (SO_2), nitrogen oxides (NO_2), carbon dioxide (CO_2), carbon monoxide (CO), hydrocarbons (HC) (Pb), lead (H_2SO_4), sulfuric acid (O_3), ozone, (As) arsenic, (Cd) cadmium, fluoride (F) , benzene (C_6H_6), mercury (Hg), hydrogen chloride (HCL), hydrogen chloride (HCL), etc., are present in a certain proportion in the atmosphere If the ratio of their presence changes, then the situation of air pollution is created due to uncleanness of the environment.

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Figure: 4.1 - Smoke rising from the garbage

Figure: 4.2 - Smoke rising from the Vehicle at railway station road

The effects of pollution are beginning to be seen widely in the world. While pollution is harming the natural environment, its effect is harming humans and animals as well as various types of flora. Pollution is mainly divided into three categories - Water pollution, noise pollution and air pollution. All these pollutions have harmful effects on the environment in different ways. In the present research, the effect of air pollution on human health has been studied.

Air pollution is such a pollution that does not require any medium, it is present everywhere and everywhere, which directly affects the environment and adversely affects human health. Air pollution is playing a major role in thinning the ozone layer. If seen in everyday lifestyle, as soon as you step out of the house, it feels like how polluted the air has become. Air pollution is becoming a very formidable problem for human life; one of the main causes of pollution in the air is the

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natural medium - flying dust. Whether it is the operation of factories or the problem of forest fires, all kinds of situations enter harmful particles in the air, due to which pollution in the environment increases. When there is a fire in a large area of the forest, it burns the forest to ashes and when this ash enters the air, it spreads pollution. Similarly, the second major reason for pollution is the increase in population and increase in the means of transportation along with food and drink. It is the result of increasing needs that people have increased the scope of various types of facilities by changing their enjoyment and lifestyle. In which mainly automatic vehicles in the form of scooters, cars, motorcycles, heavy vehicles and increase in industrial units, increase in the number of thermal power plants etc. The result of these man-made changes is that the natural environment is changing. Due to air pollution, plants are losing their original quality. The effect of which shows the increase in various types of diseases due to the contamination of the oxygen gas consumed by humans.

While the environment is becoming toxic due to increasing pollution, its effect is also having adverse effects on the atmospheric layers. Due to this type of pollution, the amount of various types of gases, dust particles, chemical substances as well as metallic particles has increased in the atmosphere. Due to which the duration of rainfall and its quality are adversely affected. Due to excessive amount of different types of chemical substances, the level of rainfall has become acidic. This is harming the beneficial element of the soil of the earth. The direct effect of which is directly visible on all the living beings and plants. Due to the effect of acid rain, chemical substances in humans also enter the body directly along with food items, due to which harmful side effects are visible on human health. Due to these polluted elements, human beings are suffering from various types of diseases like cancer, skin diseases, physical disabilities, mental diseases etc. Air pollution is currently taking the form of the most dangerous problem for human health. There is no country which is free from this problem. All the countries of the world, whether developed or developing, are becoming affected by the problem of air pollution by increasing the harmful elements in the environment in the race for their development. As a result, how much polluted air humans breathe is determined by various factors. These factors mainly include heating the home, availability of less polluting fuels for cooking or the impact of local pollution on people's health as soon as they

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leave the house. Because air pollution travels long distances and crosses continental channels globally.

On observing the sources of air pollution or the factors responsible for causing it, it is known that it is not possible to avoid them. Many substances are emitted in the form of these sources, including CO, CO_2, hydrocarbons, substances containing CFCs, lead, SO particulate pollutants, particulate matter, O_2NO_2 biotic and abiotic of these pollutants the adverse environmental impacts on the components are divided into the following categories.

1. Impact on Human Health
2. Effects on Weather and Climate
3. Effects on Biological Components

Effect of air pollution on human health in Ajmer city

The level of air pollution in the City is increasing day by day, according to the survey of various private hospitals, nursing homes etc. Due to which there is no decrease in the temperature of the City, due to which there has been a two-fold difference between the day and night temperatures. According to the survey report, the minimum temperature of the month of November 2019 in the City was 15.6 °C and maximum temperature was 31.5 °C. Dengue virus became more active in the city due to the increase in the amount of pollution due to the difference in temperature. Due to which a large number of people got infected with dengue disease. CMHO According to Ajmer, after testing the blood of 32 people, it was confirmed in 15 people. According to health care organizations, the number of these patients is 02 in JLN Hospital, Satellite Hospital 02 afflicted patients were admitted in Mittal Hospital and 07 in Nursing Home Ajmer. According to the data provided by Pollution Board Ajmer, maximum pollution was in RIICO industrial area and Beawar industrial area. Where pollution was found to be 30 percent more than the standard level. In the air pollution data taken before Diwali in the month of November 2019, the level of PM10 was 57 in the city, which increased to 148. The main reason for this increasing pollution was due to burning of garbage in the city and firecrackers being burnt in the form of fireworks on Diwali.

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Ajmer city hospitals

J.L.N Hospital

Kshetrapal Hospital

Government Satellite Hospital

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Mittal Hospital

Figure: 4.3- Ajmer City Hospital

According to the observation of the government records of Ajmer city, the biggest hospitals of the city are J.L.N Hospital,Mittal Hospital,Kshetrapal Hospital and Government Satellite Hospital. Suspected patients of dengue are being admitted daily in major hospitals including St-Francis Hospital, Meawar, and Nursing Home. According to the records of Ajmer CMHO office, so far 177 patients were found to be suffering from dengue including 14 patients of district hospital. Thus the number of dengue patients was found to be 90 in Mittal Hospital, 19 in Government Satellite Hospital and 291 in J.L.N Hospital. Apart from these patients, if the number of patients admitted in other hospitals of the City is included, then this number can be more than 400.

Prevention and treatment of dengue and malaria

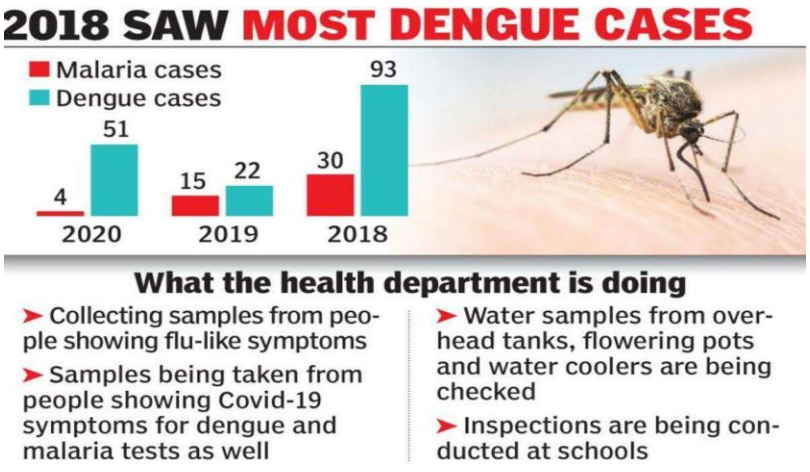

Figure 4.4 : Treatment and prevention of dengue and malaria

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Due to the increasing pollution in Ajmer, there is a problem of effective sewerage, lack of sanitation, dirty water in the taps, piles of garbage etc. in 66 bars of the city. This situation has arisen due to lack of cleanliness as planned and spraying of disinfectants and fogging. Due to which the number of dengue patients is increasing.

Table 4.1: Pollution status in Ajmer Nagar

(As per the period from the month of October 2020 to the month of November 2020)

S.No	Year	Year Site	PM10 Status (Micrograms Per Cubic Meter)
1	28 October 2020	RIICO AERA	189
2	29 October 2020	RIICO AERA	164
3	30 October 2020	Railway Station	142
4	31 October 2020	Railway Station	131
5	01 November 2020	Civil Lines	165
6	02 November 2020	Civil Lines	148

Source: Air report published on 05.11.2020 in Dainik Bhaskar newspaper

Effects of pollutants on human health

Today, AC is being used in excessive quantity by the public. And due to the depletion of ozone from the chlorofluorocarbon gas released from the use of cosmetics, the fear of incurable diseases like skin disorders and cancer has been expressed. Apart from this, diseases of the eyes, throat and lungs also occur. Due to the high concentration of air pollutants during the rainy season, due to acid rain, the water of the water reservoirs on the surface and ground water gets polluted.

According to research, India is also a major country in the highest levels of outdoor pollution in the world, in which according to the most comprehensive estimate of increasing pollution in the air in both satellite and Indian ground-level measurements of fine particulate matter, 99.9 percent of the Indian population is such a geo- Resides in the part where in the year 2015, P.M. The air quality for 2.5 exceeded the 10μm2 guideline. In 2015, particulate matter from several such major sources accounted for nearly 1.1 million deaths from air pollution or 10.6 percent of all deaths in India. The burning of residential biomass was responsible for 26,7,700 deaths, or about 25 percent

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of all deaths due to fine particulate matter 2.5, making it the most important anthropogenic source of mortality in 2015. Similarly, due to transportation as well as distributed diesel and brick production, fine particulate matter is causing many diseases. In 2015, 23,100 people died in transportation, 20,400 from distributed diesel and 24,100 from brick production. If no action is taken under such circumstances, this loss to the population from fine particulate matter 2.5 is likely to increase by more than 40 percent by 2050. An increase in the amount of particulate matter in the air is likely to lead to an increase in diseases in the future as the age and number of the population increases and more people will become more susceptible to air pollution. In comparison to nearly 11 lakh deaths in the year 2015, due to lack of action to stop pollution, widely PM. Deaths due to 2.5 are projected to rise to 3.6 million.

By taking action to prevent and prevent air pollution, about 1.2 million deaths can be avoided and the spread of diseases can be reduced in all major areas. In this sequence, the Government of India is constantly striving for the purity of the air, which will be especially true for the activities of making people healthy. These include reducing the harmful effects of dust related to residential biomass combustion, coal burning and human activities.

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