1.5 EFFECTS OF AIR POLLUTION ON HUMANS

People experience a wide range of health effects from being exposed to air pollution. Effects can be broken down into short-term effects and long-term effects.

Short-term effects, which are temporary, include illnesses such as pneumonia or bronchitis. They also include discomfort such as irritation to the nose, throat, eyes, or skin. Air pollution can also cause headaches, dizziness, and nausea. Bad smells made by factories, garbage, or sewer systems are considered air pollution, too these odors are less serious but still unpleasant.

Long-term effects of air pollution can last for years or for an entire lifetime. They can even lead to a person's death. Long-term health effects from air pollution include heart, lung cancer, disease and respiratory diseases such as emphysema. Air pollution can also cause long-term damage to people's nerves, brain, kidneys, liver, and other organs. Some scientists suspect air pollutants cause birth defects. Nearly 2.5 million people die worldwide each year from the effects of outdoor or indoor air pollution.

Health Effects of Sulfur Dioxide:

Sulfur dioxide irritates the skin and mucous membranes of the eyes, nose, throat, and lungs. High concentrations of SO_2 can cause inflammation and irritation of the respiratory system, especially during heavy physical activity. The resulting symptoms can include pain when taking a deep breath, coughing, throat irritation, and breathing difficulties. High concentrations of SO_2 can affect lung function, worsen asthma attacks, and worsen existing heart disease in sensitive groups. This gas can also react with other chemicals in the air and change to a small particle that can get into the lungs and cause similar health effects.

Health Effects of Nitrogen Dioxide:

Breathing air with a high concentration of NO_2 can irritate airways in the human respiratory system. Such exposures over short periods can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms.

Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO_2.

NO_2 along with other NO_x reacts with other chemicals in the air to form both particulate matter and ozone. Both of these are also harmful when inhaled due to effects on the respiratory system.

Health Effects of Particulate Matter:

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream.

Exposure to such particles can affect both your lungs and your heart. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- Premature death in people with heart or lung disease
- Nonfatal heart attacks
- Irregular heartbeat
- Aggravated asthma
- Decreased lung function
- Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.
- People with heart or lung diseases, children, and older adults are the most likely to be affected by particle pollution exposure.

Health Effects of Carbon monoxide:

It is a colorless, odorless, tasteless, and toxic air pollutant; The largest anthropogenic source of CO is vehicle emissions, Breathing high concentrations of carbon monoxide leads to reduced oxygen (O2) transport by hemoglobin and has health

effects that include headaches, increased risk of chest pain for the persons with heart diseases.

Carbon monoxide is a toxic gas that you cannot see or smell, CO is given off whenever fuel or other carbon-based materials are burned, vehicle emissions increase unhealthful ambient CO concentrations, but with the introduction of emissions controls, particularly automotive catalysts, estimated CO emissions from all sources decreased by 21%, The locations that continue to have high concentrations of CO contain high pollution.

When the engines and vehicle emissions-control equipment operate less efficiently, The combustion is less complete, and catalysts take longer to become fully operational, So, The products of incomplete combustion are formed in higher concentrations. Carbon monoxide is a dangerous, poisonous substance if the people are exposed to it in high quantities, The industrial processes where carbon monoxide may be produced include metal manufacturing, the electricity supply, mining metal ore and coal, food manufacturing, extracting oil and gas from land or sea, The production of chemicals, cement lime, plaster and concrete manufacturing, and petroleum refining.

Health Effects of Ozone:

- Cause coughing and sore or scratchy throat.
- Make it more difficult to breathe deeply and vigorously and cause pain when taking a deep breath.
- Inflame and damage the airways.
- Make the lungs more susceptible to infection.
- Aggravate lung diseases such as asthma, emphysema, and chronic bronchitis.
- Increase the frequency of asthma attacks.

Health Effects of Lead:

Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the

blood. The lead effects most likely to be encountered in current populations are neurological effects in children.

EFFECTS OF AIR POLLUTIONS ON MATERIALS:

- The damage due to air pollution on materials is really a serious concern since the service life of buildings is remarkably reduced. It is true that the intensity of manmade pollutants on building degradation is more than the impact of natural pollutants.
- Most importantly the affects of soiling, degradation, corrosion and erosion caused by sulphur dioxide are very much serious.
- The effect of air pollution on materials may be seen in terms of discoloration, material loss, structural failing and soiling.
- Both discoloration and structural failure due to air pollution on buildings may be insignificant and that may not involve huge coasts. But the effect of corrosion due to acidic deposition costs a lot.
- Especially the effect of sulphur dioxide and nitrogen dioxide emissions is very much significant.
- The effect of calcium sulphate has been very significant and may be continued for fairly long time.
- When calcium carbonate dissolves in sulphuric acid leads to the formation of calcium sulphate. The calcium sulphate when it falls on stone breaks the surface of the building blocks.
- The acid rain and photochemical smog affect metals and buildings .Acid rain pollutes the soil and water sources.
- Acidic products of the air pollutant cause disintegration of textile, paper. Many small industrial units and sources of locomotive pollutants have been sifted to save the famous marble structure, Taj Mahal at Agra.
- Hydrogen sulphide decolorizes silver and lead paints. Ozone oxidizes rubber goods.