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Micro-Project Report

"Air Pollution"

1. Aims/Benefits of the Micro-Project:

1. Understanding the meaning Air pollution.

2. To find the different types of Air pollution.

3. To understand the link between the types of Air pollution.

2. Course Outcome Addressed:

1. Develop public awareness about Air Polllution.

2. Apply techniques to reduce Air pollution

3.Proposed Methodology:

The most basic solution for air pollution is to move away from fossil fuels, replacing them with alternative energies like solar, wind and geothermal. Producing clean energy is crucial. But equally important is to reduce our consumption of energy by adopting responsible habits and using more efficient devices. A Methodology of Assessment of Air Pollution Health Impact Based on Structural Longitudinal Modelling of Hierarchical Systems and Fuzzy Algorithm: Application to Study of Children Respiratory Functions : Epidemiology. Poor air quality has harmful effects on human health, particularly the respiratory and cardiovascular systems. Pollutants can also damage plants and buildings, and smoke or haze can reduce visibility. Vehicle emissions, fuel oils and natural gas to heat homes, by-products of manufacturing and power generation, particularly coal-fuelled power plants.

4. Action Plan:

Sr. No.	Details of Activity	Planned Start date	Planned Finish date	Name of Responsible Team Members
1	Search the topic	05-09-2022	09-09-2022	
2	Search the information	10-09-2022	12-09-2022	
3	Collect the valid information related to the project from searched information	16-09-2022	19-09-2022	
4	Preparing the project and report for verification	23-09-2022	24-09-2022	Ganesh Vishwanath More
5	Collecting the information of air pollution types	30-09-2022	10-10-2022	
6	Adding some air pollution images	08-10-2022	03-12-2022	
7	Finally making a report for the project	02-12-2022	02-12-2022	
8	Finalizing project with report.	10-12-2022	10-12-2022	

5. Resources Required:

Sr. No.	Name of resource / material	Specification	Quantity	Remarks
1	Computer	WINDOWS 11,8GB RAM, 1TB HDD	1	
2	Operating System	WINDOWS 11	1	
3	Browser	Chrome	1	

6. Names of Team Member with Roll No.:

Sr. No.	Enrollment No.	Name of Team Member	Roll No.
1	2010950104	More Ganesh Vishwanath.	27

Ms. Dharashive A.S.

Name and Signature of the Teacher

Micro-Project Report

"Air Pollution"

1. Rationale:

The rationale is that if air pollution is a factor affecting mortality for the more susceptible populations at risk, it may al- ready be effective during the first few months of life.

Vehicle emissions, fuel oils and natural gas to heat homes, by-products of manufacturing and power generation, particularly coal-fueled power plants, and fumes from chemical production are the primary sources of human-made air pollution.Air pollution can damage crops and trees in a variety of ways. Groundlevel ozone can lead to reductions in agricultural crop and commercial forest yields, reduced growth and survivability of tree seedlings, and increased plant susceptibility to disease, pests and other environmental stresses (such as harsh weather).Reduce the number of trips you take in your car. Reduce or eliminate fireplace and wood stove use. Avoid burning leaves, trash, and other materials. Avoid using gaspowered lawn and garden equipment.Healthy ecosystems clean our water, purify our air, maintain our soil, regulate the climate, recycle nutrients and provide us with food. They provide raw materials and resources for medicines and other purposes. They are at the foundation of all civilisation and sustain our economies. Due to pollution and deforestation, the health of many people is poor. Conserving the Environment would certainly improve the health of people.

Most noteworthy, saving Environment would reduce many diseases. Saving Environment would certainly protect the animals.

2. Aims/Benefits of the Micro-Project:

1. Understanding the meaning Air pollution.

2. To find the different types of Air pollution.

3. To understand the link between the types of Air pollution.

3. Course Outcomes Achieved:

1. Develop public awareness about Air Pollution.

2. Apply techniques to reduce Air pollution

4. Literature Review:

Air pollution is a worldwide environmental and health issue, especially in major developing countries. A recent World Health Organization report shows about 3 million deaths in the world in 2012 are due to ambient air pollution and China and India are the countries with the most severe challenge.

Air pollution influences people's thought and experience of their lives directly by visual perceptions.

This reduces people's subjective well-being (SWB) to a significant degree. Empirical researchers have made efforts to examine how self-reported well-being varies with air quality typically by survey method – matching SWB data with monitored air pollution data. Their findings show NO2, particles, lead, SO2 and O3 have significant negative impact on SWB. However, it is very hard to match air pollution characteristics from monitor stations with each respondent's state of SWB at the moment a survey is conducted. Also it is very hard to find the detailed trend impact from only air pollution factor on SWB.

5. Actual Methodologies Followed:

Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials

✚ There are many different types of air pollutants:-

Gases (including ammonia, carbon monoxide, sulfur dioxide, nitrous oxides, methane, carbon dioxide and chlorofluorocarbons), particulates (both organic and inorganic), and biological molecules.

Air pollution can cause diseases, allergies, and even death to humans; it can also cause harm to other living organisms such as animals and food crops, and may damage the natural environment (for example, climate change, ozone depletion or habitat degradation) or built environment (for example, acid rain). Air pollution can be caused by both human activities and natural phenomena.

Air pollution from a factory in Nepal

Air pollution is a significant risk factor for a number of pollution-related diseases, including respiratory infections, heart disease, COPD, stroke and lung cancer. Growing evidence suggests that air pollution exposure may be associated with reduced IQ scores, impaired cognition, increased risk for psychiatric disorders such as depression and detrimental perinatal health. The human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system. Individual reactions to air pollutants

depend on the type of pollutant a person is exposed to, the degree of exposure, and the individual's health status and genetics. ⬇ **Sources of air pollution**

- Anthropogenic (human-made) sources

- Aviation is a major source of air pollution.

- Controlled burning of a field outside of Statesboro, Georgia, in preparation for spring planting

- Smoking of fish over an open fire in Ghana, 2018
- These are mostly related to the burning of fuel.

⬇ Stationary sources include:

- fossil-fuel power plants and biomass power plants both have smoke stacks (see for example environmental impact of the coal industry)
- Oil and gas sites that have methane leaks
- burning of traditional biomass such as wood, crop waste and dung. (In developing and poor countries, traditional biomass burning is the major source of air pollutants. It is also the main source of particulate pollution in many developed areas including the UK & New South Wales. Its pollutants include PAHs.
- manufacturing facilities (factories)
- a 2014 study found that in China equipment-, machinery-, and devicesmanufacturing and construction sectors contributed more than 50% of air pollutant emissions better source needed] This high emission is due to high emission intensity and high emission factors in its industrial structure.
- waste incineration (incinerators as well as open and uncontrolled fires of mismanaged waste, making up about a fourth of municipal solid terrestrial waste.

Dust storm approaching Stratford, Texas in 1935

Natural sources

- Dust storm approaching Stratford, Texas in 1935
- Dust from natural sources, usually large areas of land with little vegetation or no vegetation
- Methane, emitted by the digestion of food by animals, for example cattle
- Radon gas from radioactive decay within the Earth's crust. Radon is a colorless, odorless, naturally occurring, radioactive noble gas that is formed from the decay of radium. It is considered to be a health hazard. Radon gas from natural sources can accumulate in buildings, especially in confined areas such as the basement and it is the second most frequent cause of lung cancer, after cigarette smoking.
- Smoke and carbon monoxide from wildfires. During periods of active wildfires, smoke from uncontrolled biomass combustion can make up almost 75% of all air pollution by concentration.

Guidelines

Main article: Air quality guideline

The US EPA has estimated that limiting ground-level ozone concentration to 65 parts per billion (ppb), would avert 1,700 to 5,100 premature deaths nationwide in 2020 compared with the 75 ppb standard. The agency projected the more protective standard would also prevent an additional 26,000 cases of aggravated asthma, and more than a million cases of missed work or school. Following this assessment, the EPA acted to protect public health by lowering the National Ambient Air Quality Standards (NAAQS) for ground-level ozone to 70 ppb. A new economic study of the health impacts and associated costs of air pollution in the Los Angeles

Basin and San Joaquin Valley of Southern California shows that more than 3,800 people die prematurely (approximately 14 years earlier than normal) each year because air pollution levels violate federal standards.

Cardiovascular disease

A 2007 review of evidence found that for the general population, ambient air pollution exposure is a risk factor correlating with increased total mortality from cardiovascular events (range: 12% to 14% per 10 µg/m3 increase).

Air pollution is also emerging as a risk factor for stroke, particularly in developing countries where pollutant levels are highest. A 2007 study found that in women, air pollution is not associated with hemorrhagic but with ischemic stroke. Air pollution was also found to be associated with increased incidence and mortality from coronary stroke in a cohort study in 2011. Associations are believed to be causal and effects may be mediated by vasoconstriction, low-grade inflammation and atherosclerosis. Other mechanisms such as autonomic nervous system imbalance have also been suggested.

- **Lung disease**

Research has demonstrated increased risk of developing asthma and chronic obstructive pulmonary disease (COPD) from increased exposure to traffic-related air pollution. Additionally, air pollution has been associated with increased hospitalization and mortality from asthma and COPD. COPD includes diseases such as chronic bronchitis and emphysema. The risk of lung disease from air pollution is greatest for the following groups of people: infants and young children, whose normal breathing is faster than that of older children and adults; the elderly; those who work outside or spend a lot of time outside; and those who have heart or lung disease.

A study conducted in 1960–1961 in the wake of the Great Smog of 1952 compared 293 London residents with 477 residents of Gloucester, Peterborough, and Norwich, three towns with low reported death rates from chronic bronchitis. All subjects were male postal truck drivers aged 40 to 59. Compared to the subjects from the outlying towns, the London subjects exhibited more severe respiratory symptoms (including cough, phlegm, and dyspnea), reduced lung function (FEV1 and peak flow rate), and increased sputum production and purulence. The differences were more pronounced for subjects aged 50 to 59. The study controlled for age and smoking habits, so concluded that air pollution was the most likely cause of the observed differences. More studies have shown that air pollution exposure from traffic reduces lung

function development in children and lung function may be compromised by air pollution even at low concentrations.

- **Cancer (lung cancer)**

Unprotected exposure to PM2.5 air pollution can be equivalent to smoking multiple cigarettes per day, potentially increasing the risk of cancer, which is mainly the result of environmental factors.

Around 300,000 lung cancer deaths were attributed globally in 2019 to exposure to fine particulate matter, PM2.5, contained in air pollution.

A review of evidence regarding whether ambient air pollution exposure is a risk factor for cancer in 2007 found solid data to conclude that long-term exposure to PM2.5 (fine particulates) increases the overall risk of non-accidental mortality by 6% per a 10 microg/m3 increase. Exposure to PM2.5 was also associated with an increased risk of mortality from lung cancer (range: 15% to 21% per 10 microg/m3 increase) and total cardiovascular mortality (range: 12% to 14% per a 10 microg/m3 increase).
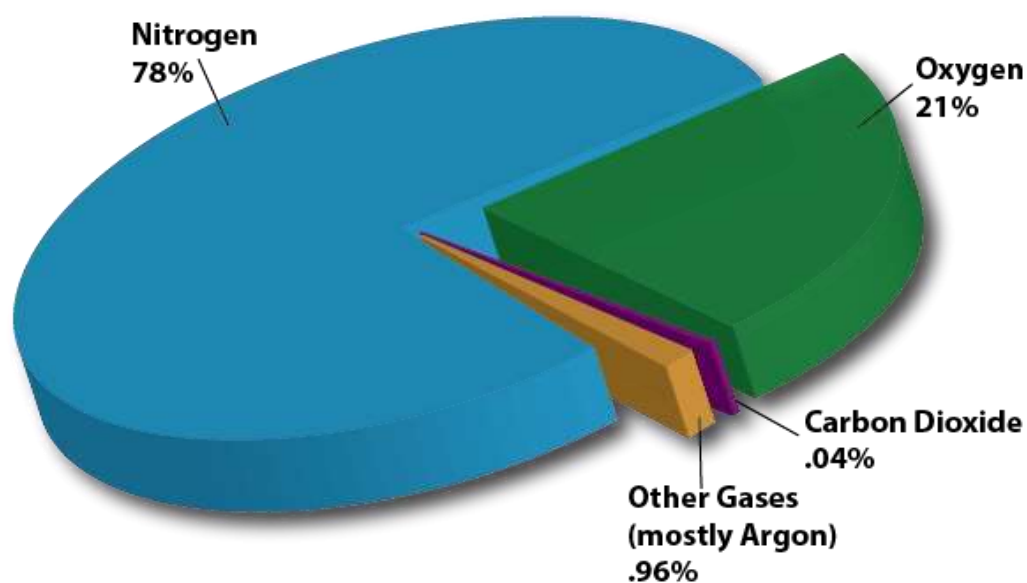
The review further noted that living close to busy traffic appears to be associated with elevated risks of these three outcomes – increase in lung cancer deaths, cardiovascular deaths, and overall non-accidental deaths. The reviewers also found suggestive evidence that exposure to PM2.5 is positively associated with mortality from coronary heart diseases and exposure to SO2 increases mortality from lung cancer, but the data was insufficient to provide solid conclusions. Another investigation showed that higher activity level increases deposition fraction of aerosol particles in human lung and recommended avoiding heavy activities like running in outdoor space at polluted areas.

In 2011, a large Danish epidemiological study found an increased risk of lung cancer for people who lived in areas with high nitrogen oxide concentrations. In this study, the association was higher for non-smokers than smokers. An additional Danish study, also in 2011, likewise noted evidence of possible associations between air pollution and other forms of cancer, including cervical cancer and brain cancer. A study presented in 2022 outlined the biological basis for how air pollution causes cancer.

Modifying a production process to produce less waste. Using non-toxic or less toxic chemicals as cleaners, degreasers and other maintenance chemicals. Implementing water and energy conservation practices. Reusing materials such as drums and pallets rather than disposing of them as waste.In its most common sense, methodology is the study of research methods.

However, the term can also refer to the methods themselves or to the philosophical discussion of associated background assumptions. A method is a structured procedure for bringing about a certain goal. A popular and helpful categorization separate qualitative methods into five groups: ethnography, narrative, phenomenological, grounded theory, and case study.Air pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans and other living beings, or cause damage to the climate or to materials. There are many different types of air pollutants, such as gases (including ammonia, carbon monoxide, sulfhur dioxide, nitrous oxides, methane, carbon dioxide and chlorofluorocarbons), particulates (both organic and inorganic), and biological molecules. Air pollution can cause diseases, allergies, and even death to humans; it can also cause harm to other living organisms such as animals and food crops, and may damage the natural environment (for example, climate change, ozone depletion or habitat degradation) or built environment (for example, acid rain).

Air pollution can be caused by both human activities and natural phenomena. Air pollution is a significant risk factor for a number of pollution-related diseases, including respiratory infections, heart disease, COPD, stroke and lung cancer. Growing evidence suggests that air pollution exposure may be associated with reduced IQ scores, impaired cognition, increased risk for psychiatric disorders such as depression and detrimental perinatal health. The human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system. Individual reactions to air pollutants depend on the type of pollutant a person is exposed to, the degree of exposure, and the individual's health status and genetics.

5. Actual Resources Used:

Sr. No.	Name of resource / material	Specification	Quantity	Remarks
1	Computer	WINDOWS 10,8GB RAM, 1 TB SSD	1	
2	Operating System	WINDOWS 10	1	
3	Browser	Chrome	1	

6. Skill developed / Learning out of this Micro-Project:

There are so many thing that we learn from this project of

1.   We learn from this project is, air pollution and their types.

2.   We learnt how to reduce and what are effects of air pollution

3.   So we have to follow all the precautions to reduce the air pollution

This all thing we learn from this project.

5. Applications of this Micro-Project:

Applications of air pollution can be used for dispersion modelling i.e predicting the path of the pollutant concentration and for calculation of ground sources, such as hazardous waste spills.

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