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What does 'qualifying text' mean?
Our model only processes qualifying text in the form of long-form writing. Long-form writing means individual sentences contained in paragraphs that make up a longer piece of written work, such as an essay, a dissertation, or an article, etc. Qualifying text that has been determined to be likely AI-generated will be highlighted in cyan in the submission, and likely AI-generated and then likely AI-paraphrased will be highlighted purple.

Non-qualifying text, such as bullet points, annotated bibliographies, etc., will not be processed and can create disparity between the submission highlights and the percentage shown.

The Effects of Air Pollution on Health and the Environment

Introduction

Both people and the world are in great danger from air pollution. People are to blame for it because of things like energy production, vehicle emissions, and industry processes that release dangerous pollutants like particulate matter (PM), nitrogen oxides (NOx), sulfur dioxide (SO2), and volatile organic compounds (VOCs). Not only do these toxins make the air quality worse, but they also cause many other problems, ranging from serious health problems to global climate change. This essay examines air pollution's natural and health effects, focusing on how pollutants hurt the environment and people's health. It also talks about how different socioeconomic groups are more or less exposed to air pollution and what is being done to lessen these effects.

Effects of Air Pollution on the Environment

Polluted air hurts communities and the world as a whole in big ways. Air quality worsens because of ozone, sulfur dioxide, and nitrogen oxides. This, in turn, affects plants, animals, water, and the land. Acid rain is one of the most noticeable effects. It happens when sulfur dioxide and nitrogen fumes in the air mix with water vapor to make sulfuric and nitric acids. This makes soils and water more acidic, which hurts woods, lakes, and aquatic environments (Keshtgar et al., 2021).

Also, air pollution makes climate change worse. As the Earth's atmosphere warms, greenhouse gases like carbon dioxide (CO2), methane (CH4), black carbon, and ozone trap heat, which causes the Earth to warm. Marko Tainio (2016) says that particulate matter from burning wood and industrial processes directly warms the air by absorbing sunshine. It also changes the way clouds form and how much rain falls. This creates a cycle where the environmental damage caused by air pollution worsens climate change, making weather events like heatwaves and rains happen more often and with more force (Tainio, 2016).

It is also true that air pollution like nitrogen dioxide (NO2) and ground-level ozone (O3) directly hurt plants. High ozone levels can hurt the stomata, the tiny holes in leaves where gas exchange occurs. This can slow plant growth and lower food yields. Syuhada et al. (2023) say this can hurt food stability and wildlife in the long run. Because of this, air pollution affects ecosystems and climate trends worldwide that go far beyond limited damage.

Effects of Air Pollution on Health

Air pollution has serious and widespread effects on health. Each year, bad air quality is linked to millions of early deaths. Ground-level ozone and fine particulate matter (PM2.5) are the most dangerous toxins to human health because they get deep into the circulatory and respiratory systems. Exposure to these toxins over a long period has been linked to long-term lung illnesses like asthma, bronchitis, and chronic obstructive pulmonary disease (COPD) (Lee, 2021).

People who live in cities with lots of traffic and factories that release pollution into the air are more likely to get respiratory diseases. Children, the old, and people who already have health problems are especially at risk. Jong Tae Lee wrote in 2021 that air pollution not only worsens breathing problems but also stops kids' lungs from growing properly, which can cause long-term health problems. High levels of toxins in the air during pregnancy have been linked to low birth weight and delays in

development. This shows how serious air pollution is as a public health issue (Lee, 2021).

In addition to making lung diseases more likely, air pollution also makes heart diseases much more likely. PM2.5 particles can get into the bloodstream and cause inflammation and oxidative stress. This can lead to atherosclerosis, heart attacks, and strokes. Researchers have found that even short-term exposure to high amounts of PM2.5 can cause heart problems in vulnerable people (Gray, 2014). People exposed to nitrogen dioxide (NO2) for a long time may also be more likely to get high blood pressure and heart failure.

In addition, air pollution is a major cause of cancer. Studies show that toxins like benzene, formaldehyde, and polycyclic aromatic hydrocarbons (PAHs) can cause cancer, especially lung cancer if they are exposed for a long time (Syuhada et al., 202<). The International Agency for Research on Cancer (IARC) has labeled outdoor air pollution, especially particulate matter, as a Group 1 cancer. This means that it is very dangerous to people's health, right up there with asbestos and tobacco smoke.

Social and economic factors and differences

Air pollution hurts low-income people and marginalized groups more than others, making health gaps worse. People are more likely to be exposed to high amounts of pollution in many developing countries where rules about businesses are not as strict. Leila Keshtgar (2021) says that poor people often live in areas with more air pollution because they are close to factories, roads, and places that burn trash. This makes it more likely for people in these areas to get lung and heart illnesses.

In cities, the problem is made worse by bad healthcare facilities that make it harder for disadvantaged groups to get help quickly for illnesses caused by pollution. Lack of access to clean energy sources in emerging areas also worsens indoor air pollution since many homes heat and cook with solid fuels like coal, wood, and gas. High indoor air pollution happens because of this, and women and children are more likely to be affected (Gray, 2014).

The amount of air pollution people are exposed to varies around the world. The air quality in many wealthy countries has improved because of tighter environmental laws, but the air quality in developing countries is still worsening. For instance, air pollution levels often go above the World Health Organization (WHO) standards in some parts of South Asia and Africa, which causes millions of early deaths every year (Syuhada et al., 202<). The fact that these differences exist shows how important it is for countries to work together and make fair rules that protect weak groups and fix the problems that cause air pollution.

Policies and Efforts to Reduce Damage

We must use a mix of global and local tactics to fix the problems that air pollution causes for health and the environment. Several policies have been put in place by governments and foreign groups to cut down on pollution and make the air better. The Paris Agreement is one of the most important efforts. Its goal is to limit the rise in world temperature by reducing greenhouse gas production. The agreement aims to reduce air pollution and climate change by focusing on major pollution causes like energy production, transportation, and industry processes (Syuhada et al., 202).

New technologies are also very important for reducing air pollution. By switching to sustainable energy sources like solar and wind power, we can cut down

on pollution from burning fossil fuels by a large amount. Additionally, improvements in vehicle technology, such as the creation of electric and hybrid cars, could lower air pollution caused by traffic (Keshtgar et al., 2021). Policies supporting public transportation and city planning that encourage walking and biking are also good ways to clean up the air in places with many people.

Also, the World Health Organization (WHO) and the United Nations Environment Programme (UNEP) have created standards and tracking systems for air quality to help countries keep track of their progress in lowering pollution levels. These rules are especially important for developing countries that do not have many air quality standards or do not follow them very well (Gray, 2014). For these policies to work, states, businesses, and people must first agree to protect the environment and public health.

Conclusion

Air pollution is still one of the biggest problems we face today in terms of both the environment and general health. Its effects can be seen and felt all over the world, from environments being damaged to millions of people dying too soon every year. It is well known that air pollution can cause health problems like lung and heart diseases. However, the fact that some people are more likely to be exposed to it than others and that efforts to reduce it are not being shared equally shows that we need policies that include everyone. Going forward, it will be important to keep working on and implementing technologies and strategies to lower emissions. This, along with working with other countries, will be needed to deal with the many negative effects of air pollution on people and the environment.