

Interactive Repercussions of Ambitious Air Pollution and Climate Change

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Introduction

The environment serves three functions for us: it is a living area, a resource depot, and a trash disposal site. However, the ecology of the planet is gradually deteriorating as a result of human presence and activity. The planet's current state is usually defined by the air pollution and climate change; they are also the possible explanation for why we are seeing the growing concern among the public and institutions that have derived the campaigns urging us to 'save the planet,' and 'turn down the heat'. And this is basically the reason why the government is attempting to build a viable strategy through policies to improve the air quality and reduce the air pollution caused by major industry segments. With this, we can state that the two primary sources of climate change and global warming are air pollution and greenhouse gasses.

The release of dangerous compounds into the Earth's atmosphere is referred to as air pollution, and it has negative consequences for the natural ecosystem. In 2018, WHO Director General Dr. Tedros Adhanom Ghebreyesus labeled air pollution a "hidden public health disaster" during the first WHO Global Conference on Air Pollution and Health. Air pollution causes around 7 million premature deaths per year, with roughly 4 million of those fatalities owing to outdoor air pollution (IASS, n.d.). This anticipates that air pollution has set its dominant position in the climate change arena disrupting both the ecosystem and health of individuals, which is similar to the context of climate change.

Today, we are more mindful than ever of the link underlying environmental stewardship, personal and public health, and a robust economy in the midst of the worst public health emergency in decades. As we begin a new millennium of environmental activism, it's important to take stock of where we've been so that we can face new and pressing challenges with optimism and determination.

The need of clean air

It is necessary for living beings to breathe oxygen in order for their cells to operate. There really is no life without air. Furthermore, air promotes the water cycle by assisting water in moving from one condition to another, i.e. from ice to water vapors. Air is critical in the

recycling of one of the most important chemicals on the planet: carbon. Carbon is required for living things to survive, develop, and propagate. Air pollution has become one of the multidimensional issues that is the world's largest environmental health hazard, costing the global economy an estimated \$8.1 trillion in 2019, and approximately 6.1 percent of global GDP (Kemper, 2021). And with the increased air pollution, the clean air has become a demanding pivot axis.

The 'clean air' is not only an important context for humans but also a fundamental requirement for plants and animals; which means 'clean air' is an ecological concern. The clean air attributes to better health among individuals by lowering the death rates that is usually attributed by the pollution causing an effect to lungs, heart, respiratory problems and have weakened the physical, emotional and psychological state of an individual. And when we talk about the environment, the pollution diverges its effects from widespread of invasive species to acidic rain to increase in the generative greenhouses gasses causing more global warming. So, when there is clean air production to the whole world, it demonstrates an increment in the social, economy, cultural and political life of an individual benefitting globally. Now what's more compelling is air pollution has contributed to more economical consequences in the current state. Air pollution has caused more harm than good, have lessened people's capacity to function, impacted the essential products like food, have wrecked the cultural and historical edifices, diminished ecological systems' capabilities to accomplish functions that society requires, and have increased more costs in remedial work and restoration. What we need to remember is a thriving economy and cleaner air are always connected at the hip. Cleaner air safeguards the ecosystems on which many people and the country rely for their survival and prosperity. And with economy comes the health side by side because cleaner air improves human health, having high air quality equals lesser missed work days and less money spent on illnesses caused by air pollution.

Today, combating air pollution is among our generation's most difficult tasks. Air management has never been more due to the increasing urbanization, roadway, sea, and air constraints.

Role of air pollution in climate penalty and vice versa

Greenhouse gasses (GHGs) are the first thought that is bound to come to mind when discussing climate change. And with the concept of greenhouse gasses, we anticipate carbon dioxide as its first component. Carbon dioxide is the most frequent gas created by human activities. Carbon dioxide is primarily produced by the extraction and combustion of fossil fuels such as coal and oil, and it is responsible for the vast majority of man-made global warming and contributes to this pollution. What's more interesting about this particle is, it can linger in the atmosphere for years, making its environmental footprint even more substantial. In this sense, we might argue that climate change is produced by a pollutant blanket that confines warmth around the globe.

Climate change can have an effect on regional air quality. Warming of the atmosphere as a result of climate change has the ability to boost subsurface ozone in many areas, posing a problem for future ozone standards. The presence of ozone in the stratosphere heats the temperature, whereas differing elements of fine particulates matter can either warm or chill it. With this regard in a particular damaging feedback loop, polluted air not only adds to but also exacerbates climate change. The Earth is experiencing more extreme weather as a result of climate change, such as heat waves, famine, and drought which can have a negative influence on air quality. Because the chemical catalysts that produce ozone in the stratosphere occur more frequently in warm conditions, heat waves induce a rise in ground-level ozone pollution.

Air pollution and climate change are a series of events that lead to a negative impact on the ecosystem. For example, when fossil fuels are burned, small particles known as aerosols are discharged into the air. The majority of these particles enter the atmosphere naturally as a result of eruptions, debris, or sea spray, but some enter as a result of air pollution from automobiles, trucks, and plumes of smoke. Climate change is influenced by aerosols. What's more interesting is that these aerosols do not impact the atmosphere only in a negative manner. It also has a positive influence that plays a supportive role for the environment. Certain aerosols, such as kosher salt granules from the oceans, refract light from the sun, which can aid in climate cooling. Others, including such black carbon particles produced by the combustion of timber or fossil fuel extraction, capture the majority of the sunlight that strikes them, causing warming (UCAR Center for Science Education, 2020).

As a corollary statement, we can say that all the air particulates are not the cause for the climate change. But what today's trend in the climatic atmosphere changes indicates that these particles have very little effect and the strong reason is because of the warming temperature. For instance, the two most affected area are ice melt and drought. Ice such as that of glaciers which were considered to be the major motives in helping the rays of the sunlight refract back to the stratosphere, but with rising temperature and more conveniently the air pollution, it is causing the earth's atmosphere to degrade resulting in glaciers to melt faster as a result of air pollution rather than the global warming. For example in Northern Indian Himalayas the study conducted by Pratik Singh Thind and his team by sampling the snow from the ice where they found out that the pollutants were resulted from five major source that is, bioass burning, vehicle emissions, mineral dust, sea dusts and coal combustion as a major source to decrease in the ice (O'Hara, 2021). can you add example. Not only does it impact the ice, but its effects have also reached the proposition of drought and flooding. And all of these factors account in the process of precipitation stopping the source of cloud development and its enhancement effect on the surface ozone. As the deteriorated air increases the droplets that form in cloud gets contaminated making rain more acidic and this will create a significant impact on the terrestrial biosphere and the evapotranspiration cycle, resulting in significant air pollution. As a result, greenhouse gas emissions have a greater warming trend than aerosols have a cooling sensation.

Climate change and air pollution are inextricably related, despite the fact that they have been mainly compartmentalized in scientific policy and research. Numerous prevalent air pollutants and greenhouse gas emissions not only come from the same places, but they can also interplay chemically and physically in the atmosphere, resulting in a multitude of environmental effects on a local, regional, and global scale. The greenhouse effect is exacerbated by rising carbon dioxide as well as other air-polluting gasses, which elevates temperatures and impacts atmospheric circulation. With this we can state that pollution from global warming knows no limits.

Adaptation and Environmental justice: A New Approach

Climate change, which is a well-known topic, has always been enticed by the emotions of prevention, mitigation, and adaptation. As we enter the 'greenhouse century,' prevention can no longer be regarded as sufficient in the fight against climate change. When it comes to air

pollution, preventing air pollutants is no longer a viable option, as the troposphere and stratosphere of the globe have been highly polluted for decades. The majority of national and international responses to air pollution have centered on efforts to reduce the costs related to air pollution by reducing greenhouse gas emissions through the Paris Agreement, the Clean Air Act, or the Environmental Protection Act. The Paris Agreement which is one of the leading context for climate action agreement binding the world's nation together to keep the warming to 1.5 C. Being one of the means to climate action, this international agreement can definitely help to achieve the goal through their cooperative infrastructure where they enforce the transparency by common reporting timelines within the country. Not only that, this agreement is one of the guidelines to many nations' policies development in their nation itself. So while taking this agreement as one of the ambitious actions, the nations with the motive of creating a climate free environment can definitely be achieved. Similarly, the Clean Air Act which is an important prospectus of regulating the Environmental Protection Agency has always focused on the basicity of reducing the pollutants such as mercury, reducing the ground-level ozone pollutant as it has played a vital role in regulating the emission of pollutants that endanger the public health and welfare. However, these agreements are means but not an end and it is just a way for control and prevention as they aren't always enough to combat pollution, mitigation isn't always enough to combat air climate change.

So what's the next big step that can be taken? And the answer is adaptation. Adaptation is the process of making changes to procedures, habits, and systems in order to mitigate the impact of climate change or to capitalize on the opportunities which accompany it. To adopt the plan, the most influential start-up would begin at the micro-level by reducing vehicle emissions, utilizing safe paints, storing energy, using gas logs instead of woods, implementing recycling technologies, and using lesser pesticides and insecticides. The involvement of institutions and organizations in the effective approach can also be strengthened by spreading awareness of and being active in the planning process for a successful end. Moving to the macro level, adaptation techniques would involve policy development, as it entails a great deal of population health protection by timely monitoring of air quality and adopting suitable measures to adjust to the rapidly changing environment. There is no such thing as a "one-in-all" strategy. Many more strategies can be introduced in combating air pollution. But one thing to remember is that for curbing the air pollution the base foundation must be eliminated. Which means that for a

successful adaptation, it should not only be dependent on governments, but also on the active and long-term involvement of stakeholders such as federal, provincial, multinational, and international bodies, the public and private industries, civil society, and other key stakeholders, as well as efficient management of information must be drifted.

Furthermore, air pollution is not equitably spread across the population. Impoverished persons and particular racial and ethnic minorities are many of those who are frequently exposed to contaminants and may have stronger reactions to them. The effects of air pollution on different racial or ethnic groups, as well as those who are in a weak socioeconomic situation, have much less education, or reside near large emission sources. These disparities in pollution levels lead to deaths and more catastrophic health implications for the populations. Currently, what's more important is the ability to recognize that the revolutionary step in combating air pollution should be environmental justice. It means that the solutions to be country-driven, gender-responsive, collegial, and totally transparent, taking into account vulnerable populations, societies, and biodiversity and the protection services equal to each individual. Moreover, it should be premised on and directed by the best available evidence as well as indigenous practice and knowledge, and knowledge of the local area mechanisms, as specific, measurable, appropriate and acceptable, relevant, and time-bound with the aim of amalgamating adaptation into persistent socio-economic-cultural and environmental actions and policies.

Conclusion

Nonetheless, the conclusion is that regional climatic changes are affecting ecosystems all across the planet, particularly global air pollution increment, which is almost certainly the product of anthropogenic emissions. The more quickly climate change occurs, and the further adaptation attempts are postponed, the more complex and costly it may become. The fact that human error has wreaked havoc on the climate and biosphere, it is never too late to start over and reverse the damage we have caused to the ecosystem thus far. And if every human begins to contribute to the environment, we may be assured of our continued survival. Rather than ignoring these issues, we must take action to safeguard the planet and our future and create a living space for fresh air to breathe in.

References

- Breeze Technologies. (n.d.). *The link between air pollution and climate change*. Breeze technologies. Retrieved from <https://www.breeze-technologies.de/blog/link-between-air-pollution-and-climate-change/>
- Campi, M. C. (2017, December 15). *Cleaner air benefits human health and climate change*. European Environment Agency. Retrieved from <https://www.eea.europa.eu/articles/cleaner-air-benefits-human-health>
- CMM. (n.d.). *The Global Cost of Pollution and the Health Benefits of Clean Air*. CMM Group. Retrieved from <https://www.thecmmgroup.com/global-cost-pollution-health-benefits-clean-air/>
- IASS. (n.d.). *Air Pollution and Climate Change*. IASS. Retrieved from <https://www.iass-potsdam.de/en/output/dossiers/air-pollution-and-climate-change>
- Kemper, K. (2021, September 7). *We need healthier air for a healthier planet*. World Bank Blogs. Retrieved from <https://blogs.worldbank.org/voices/we-need-healthier-air-healthier-planet>
- Mackenzie, J., & Turrentine, J. (2021, June 22). *Air Pollution Facts, Causes and the Effects of Pollutants in the Air*. NRDC. Retrieved from <https://www.nrdc.org/stories/air-pollution-everything-you-need-know#ej>
- Minnesota Pollution Control Agency. (n.d.). *How air quality affects economies and ecosystems*. Minnesota Pollution Control Agency. Retrieved from <https://www.pca.state.mn.us/air/how-air-quality-affects-economies-and-ecosystems>
- Nagle, J. C. (n.d.). *Adapting to Pollution*. Northwestern Law. Retrieved from https://www.law.northwestern.edu/research-faculty/clbe/workingpapers/documents/nagle_adapting_to_pollution.pdf
- O'Hara, E. (2021, February 3). *Study Locates Origins of Glacier Soot Pollution in Northern India*. State of the Planet. Retrieved from <https://news.climate.columbia.edu/2021/02/03/study-locates-origins-glacier-soot/#:~:text=These%20dark%20particles%20are%20known,which%20results%20in%20Oglacier%20melting.>

- UCAR Center for Science Education. (2020). *Air Quality and climate change*. UCAR Center for Science Education. Retrieved from <https://scied.ucar.edu/learning-zone/air-quality/air-quality-and-climate-change>
- Union of Concerned Scientists. (2012, February 1). *The Clean Air Act*. Retrieved from <https://www.ucsusa.org/resources/clean-air-act>
- UNECE. (n.d.). *Air pollution and economic development*. [unece.org](https://unece.org/air-pollution-and-economic-development). Retrieved from <https://unece.org/air-pollution-and-economic-development>
- United Nations Framework Convention on Climate Change. (n.d.). *What do adaptation to climate change and climate resilience mean?* unfccc.int. Retrieved from <https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean#:~:text=Adaptation%20refers%20to%20adjustments%20in,opportunities%20associated%20with%20climate%20change>
- United States Environmental Protection Agency. (n.d.). *Outdoor and Indoor Air Adaptation Strategies for Climate Change*. EPA. Retrieved from <https://www.epa.gov/arc-x/outdoor-and-indoor-air-adaptation-strategies-climate-change>
- University of Maryland. (2011, November 14). Rising air pollution worsens drought, flooding, new study finds. *ScienceDaily*. Retrieved from <https://www.sciencedaily.com/releases/2011/11/111113141304.htm>