



Development of Measures to Reduce Air Pollutants As Much As Possible

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Abstract: The papers include contemporary ecological challenges, steps taken to reduce artificial pollution, and environmental issues relating to the atmosphere's circulation through natural and artificial processes. A major threat to world health, air pollution can have a range of negative consequences on the environment, such as haze, eutrophication, acid rain, and harm to animals. The combustion of fossil fuels for energy production and transportation is the main cause of air pollution. The effects of air pollution on human health are significant, with millions of people affected by respiratory and cardiovascular diseases, reproductive and central nervous system dysfunctions, and cancer. The articles emphasize the importance of reducing air pollution through various measures, such as improving energy efficiency, promoting renewable energy sources, reducing emissions from transportation, and implementing policies and regulations to control air pollution. The articles also highlight the need for public awareness and a multidisciplinary approach to tackle the problem of air pollution and its impact on climate change and public health.

Keywords: Atmosphere, Earth's Surface, Permissible Levels, Chemical Substances, Harmful Elements, Organisms, Sanitary Norms and Rules (SanN.R.)

Introduction

Scientific and technological advancement, although evolving through various complex and sophisticated processes, still faces unresolved challenges within the framework of the interrelation between Society-Earth-Human-Community (S. T. Ruziev et al., 2022; S. T. Ruziev & Achilov, 2023; Ruziyev & others, 2023; Suleymanov & others, 2023; Toirovich et al., 2023).

One such critical issue is the escalating risks posed by environmental hazards. Upon generalizing and analyzing the incidents occurring in various corners of our planet over time, it becomes evident that anthropogenic, natural, and ecological crises are increasing annually, posing a threat to vast territories (Ismaylov et al., 2021; S. Ruziev & Suleymanov, 2020; S. T. Ruziev, 2022; S. T. Ruziev & Sultonov, 2023).

First President I. Karimov emphasized: Ecology is one of the acute social issues of modern times, the resolution of which is crucial for the benefit of all nations. The current and future civilization largely depends on the resolution of these issues." (Alimov & Rafikov, 1991; Baratov, 1991; Ismayilov et al., 2020; Suleymanov et al., n.d.)

The high responsibility of our society members - the duty to preserve natural resources and responsibly utilize them for sustainable benefits, as well as the task of environmental protection outlined in the State Basic Law, which ensures a unified state policy in combating climate change, epidemics, pandemics, and mitigating their consequences (Asha, 2022; Hill, 2023; Perera, 2022; Southerland, 2022).

The impact of air pollution on both human health and the environment is a pressing concern, particularly as industrialization and urbanization continue to progress worldwide. Scientific and technological advancements have enabled society to develop more efficient and productive means of generating energy, transportation, and manufacturing. However, these advancements also contribute to the release of pollutants into the atmosphere. This creates a complex challenge as we strive to balance the benefits of progress with the need to protect our planet and its inhabitants (Gómez-Sanabria, 2022; Leung, 2022; Munir, 2022; Murugesan, 2022; Su, 2022).

Recent trends indicate that the escalation of air pollutants has direct and indirect consequences, affecting not only human health but also the overall ecosystem. Air quality issues manifest as respiratory problems, cardiovascular diseases, and other health complications, while also impacting biodiversity and climate stability. These concerns highlight the necessity of addressing air pollution and its sources comprehensively (Hoang, 2022; Khomenko, 2021; Mohsenpour, 2021; Sun, 2022).

To combat these risks, it is essential to develop effective measures aimed at reducing air pollutants as much as possible. By focusing on innovative solutions and policy interventions, we can mitigate the adverse effects of air pollution and contribute to the sustainability of our planet. Such measures include the development and implementation of cleaner energy sources, advancements in emission control technologies, and the enforcement of stringent environmental regulations.

The need for this research is underscored by the principles outlined in our constitutional framework, which emphasize the responsible utilization of natural resources and the protection of the environment. By prioritizing the reduction of air pollutants, we

can work towards achieving a healthier, more sustainable future for generations to come. This study seeks to explore the most effective strategies and innovations to tackle air pollution, aiming for a significant and measurable reduction in pollutants to safeguard both human health and the environment.

Particularly, the Constitution grants the right to access reliable information about the state of the environment in Article 49, and in Article 68, it emphasizes the national importance of Earth, subsoil resources, water, flora and fauna, and other natural resources, stressing the necessity for their rational use and state protection.

Methodology

The following techniques will be used as part of a multifaceted approach to create and assess creative ways for lowering air pollution:

1. Literature assessment: To identify current studies and trends in air pollution, its causes, impacts, and mitigation strategies, a thorough assessment of the literature will be carried out.
2. Advanced Filtration Systems: These systems are going to be created with the goal of removing air contaminants with a high degree of selectivity and efficiency. The effectiveness, robustness, and affordability of the filtering systems will all be put to the test and assessed.
3. Strategies for Urban Planning and Transportation: To reduce emissions from automobiles and industrial operations, strategies for urban planning and transportation will be optimized. Among the tactics will be encouraging the use of sustainable and clean forms of transportation, such as walking, cycling, and electric cars, as well as enhancing public transportation networks.
4. Renewable Energy Sources: To lessen dependency on fossil fuels and cut emissions, renewable energy sources including solar, wind, and geothermal energy will be included into the current energy infrastructure. We'll assess and contrast renewable energy sources' affordability and viability with those of conventional energy sources.
5. Monitoring and Analysis: To evaluate the efficacy of the established interventions, a thorough monitoring and analysis of data on air quality will be carried out. Measurements of air pollutants like particulate matter, nitrogen dioxide, and ozone will be part of the monitoring, along with a study of how the actions would affect public health and air quality.
6. Predictive Models: To evaluate the effects of the actions on public health and air quality, predictive models will be created. The models will be used to forecast future trends in air pollution and the efficacy of the measures. They will be based on the data gathered from the monitoring and analysis.
7. Policy and Regulation: To reduce air pollution and encourage the use of sustainable and clean technology, policies and regulations will be created and put into place. The efficacy of the laws and rules as well as their effects on the environment and public health will be assessed.
8. Public Awareness: To inform the public about the harm that air pollution does to both the environment and human health, as well as the significance of lowering air pollution,

public awareness programs will be carried out. Public gatherings, instructional materials, and social media will all be used in the campaigns.

One of the main factors sustaining life in the biosphere is the atmosphere, which is the Earth's air crust. It controls the planet's surface temperature and protects all living things from dangerous cosmic radiation. Increased air pollution, especially from particulate matter, leads to a sharp increase in the population's illness rate.

Atmospheric pollution is particularly harmful to humans. Pollutants in the air are mainly absorbed through the respiratory system. Particles with a radius of 0.01-0.1 micrometers make up 50% of all pollutants suspended in the air.

Workers exposed to asbestos are at a higher risk of developing cancer. Beryllium can harm the respiratory tract, skin, and eyes. Diesel fumes can lead to damage to the nervous and respiratory systems.

Air pollution is the greatest ecological threat to public health worldwide, causing an estimated 7 million premature deaths annually. The pollution of the atmosphere and climate change are closely related, as all major pollutants affect the climate and the majority of them distribute general sources of greenhouse gases. The UNEP alert on pollution movement underscores the global state of air pollution, its primary sources, its impact on human health, and encourages national efforts to address this crucial issue.

Result and Discussion

In the 2023 World Air Quality Report (Fig.1), it was observed that the four most polluted countries in the world are in the Central and South Asian region, including Bangladesh, India, Tajikistan, and Pakistan. Additionally, within this region, some of the most polluted cities globally include Delhi in India, Lahore in Pakistan, and Tashkent in Uzbekistan. Each city's annual average PM2.5 concentration distribution demonstrates that the concentration of pollutants in urban areas is more than ten times higher than the WHO annual average guideline value.

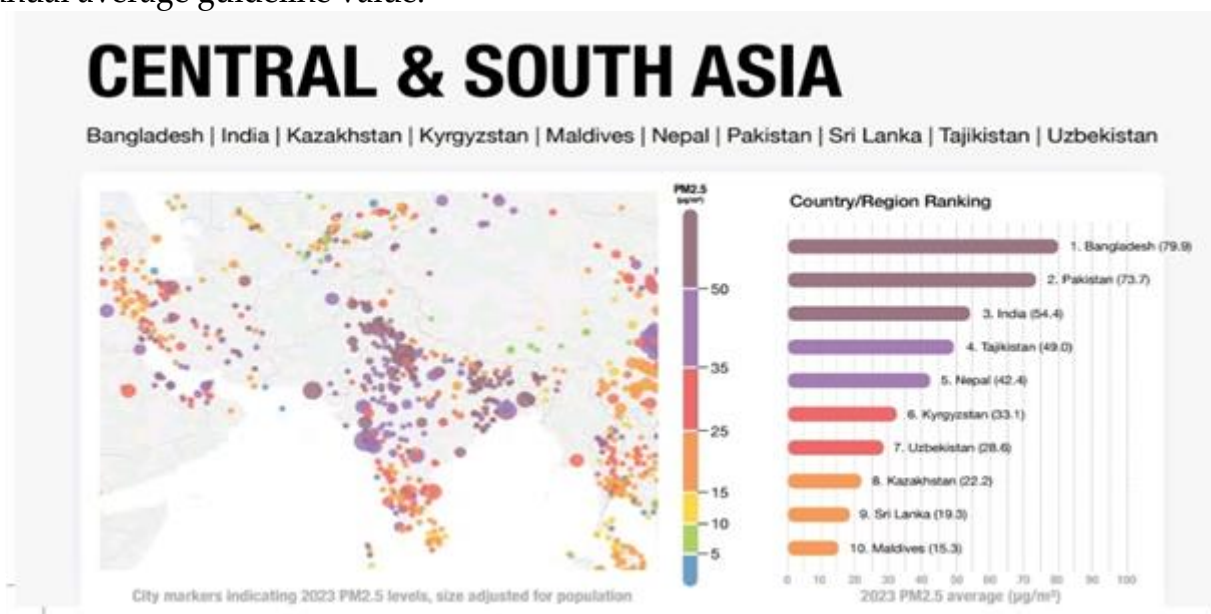


Figure 1. World Air Quality Report 2023

The main factors contributing to the pollution of our region's atmosphere are industrial emissions, ongoing construction activities, agriculture through the cultivation of cotton and other crops, and deforestation. The dust particles carried by winds from the deserts in our region get trapped in the Himalayan Mountain range, causing changes in temperature. This leads to the detection of dust storms in our country through strong winds, contributing to the world's worst air pollution.

As industrialization continues to grow worldwide, harmful gases are emitted into the atmosphere, causing significant damage to agricultural crops. According to long-term monitoring results, the amount of ecological harmful chemical compounds emitted into the atmosphere, the composition of their particulates, and the elements of ash from combustion products double every 12-14 years, making atmospheric pollution one of the global issues. Atmospheric pollution refers to changes in its composition and characteristics, negatively affecting human health, animals, plants, and ecosystems. Currently, 75% of atmospheric pollution is attributed to natural sources, while 25% is attributed to anthropogenic sources.

The solution to the problem lies in minimizing the substances that harm the atmosphere as much as possible. As we gradually destroy the biosphere and atmosphere, we ultimately harm our own health.

Conclusion

The results of the conducted experimental investigations indicate that the pollution of our atmosphere by major industrial enterprises emitting large amounts of highly dispersed particles and gases, the continued growth of construction, the increase in global temperatures with dramatic consequences such as Arctic melting, a significant increase in the water level of the world's oceans, increased soil erosion, and ultimately, the various levels of atmospheric pollution and its direct exposure to harmful gases have significant and far-reaching impacts on human health, the environment, and ecosystems. These findings underscore the urgent need for comprehensive measures to mitigate air pollution, reduce emissions from industrial sources, promote sustainable practices in construction and development, address climate change to prevent further environmental degradation, and protect public health from the harmful effects of air pollutants. The conclusions drawn from these investigations emphasize the critical importance of immediate action to combat air pollution and its associated environmental and health risks for the well-being of current and future generations.

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