AMERICAN JOURNALS
Open Access, Peer Reviewed Journals

American Journal of Research in Humanities and Social Sciences
ISSN (E): 2832-8019 Volume 31, | December - 2024

THE ROLE OF AUTOMOTIVE TRANSPORT IN AIR POLLUTION OF THE ATMOSPHERE

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ABSTRACT

This article is dedicated to studying the contribution of automotive vehicles to air pollution in the atmosphere. The harmful gases emitted by automobiles negatively impact the environment and pose a threat to human health. The issue is discussed in detail based on global experiences and statistical data. Recommendations are provided for reducing pollution levels.

KEYWORDS

Atmospheric air, automotive transport, environmental issues, harmful emissions, pollution, sustainable development

Introduction

Currently, atmospheric pollution is considered one of the global environmental issues. The contribution of transport vehicles to pollution is a serious topic of discussion in every country. The amount of harmful substances, such as carbon dioxide (CO2), nitrogen oxides (NOx), and other pollutants emitted by vehicles, is increasing every year. According to the International Energy Agency (IEA), the transport sector accounts for nearly 24% of global greenhouse gas emissions.

In urban areas, the intensification of air pollution is related to the growing number of transport vehicles. This situation causes not only ecological but also economic and social problems. According to the World Health Organization (WHO), pollution-related diseases shorten the lives of millions of people annually. Especially, risks associated with respiratory and cardiovascular diseases are increasing.

In Uzbekistan, the issue of the increasing number of vehicles is also urgent. In large cities like Tashkent, the air quality has significantly deteriorated. Transport vehicles are identified as the main factor in atmospheric pollution. This problem negatively affects not only the ecological environment but also economic development. Therefore, reducing harmful emissions from vehicles, developing and implementing sustainable development strategies, is an extremely important task at both the global and national levels.

Materials and Methods

During the research, statistical data provided by international organizations such as the World Health Organization (WHO) and IEA were analyzed. Additionally, the ecological policies and technological approaches applied in various countries were studied. Observation, comparison, and statistical analysis methods were used.

Main Part

1. **Main Harmful Substances Emitted by Automotive Transport**

Automobiles emit various harmful gases into the atmosphere, with the most common being:

- **Carbon Dioxide (CO2):** CO2 is mainly produced from the complete combustion of fuel. It is considered one of the main contributors to global warming. The transport sector accounts for approximately 14% of global CO2 emissions annually, contributing to the rise in Earth's average temperature due to greenhouse gas effects.
- **Nitrogen Oxides (NOx):** NOx is primarily produced by internal combustion engines. These substances react with oxygen and carbon monoxide in the air to form smog and acid rain. NOx is harmful to human health and can lead to respiratory diseases, asthma, and bronchitis.
- **Hydrocarbons (HC):** Hydrocarbons are another significant harmful emission from vehicles, resulting from improper use of gasoline and diesel fuels or from poorly maintained engines. Hydrocarbons react with ozone in the air to create photochemical smog, which can have serious effects on the respiratory system.
- **Carbon Monoxide (CO):** CO is produced in oxygen-deprived environments, primarily due to incomplete fuel combustion. These substances are dangerous and can affect the circulatory and respiratory systems, leading to heart disease and headaches.

2. **Smog Formation in Urban Areas.**

The increase in the number of automobiles in urban areas is one of the primary causes of smog formation (air pollution). Smog is a type of air pollution caused by high concentrations of harmful substances such as NOx, HC, and CO, primarily emitted by vehicles. Smog usually occurs on hot, sunny days, particularly in densely populated cities. It reduces visibility, makes breathing difficult, and leads to serious health issues.

3. **Impact on Human Health**

Harmful emissions from vehicles pose a serious threat to human health. Numerous scientific studies show that air pollution leads to various diseases, especially those related to the respiratory and cardiovascular systems:

- **Respiratory Diseases:** The effect of CO, NOx, and other pollutants from vehicles on the respiratory system leads to an increase in diseases such as asthma, bronchitis, and emphysema. These conditions often make breathing difficult and worsen general health.
- **Cardiovascular Diseases:** Air pollution also has a significant impact on the cardiovascular system. Poor air quality, especially high levels of CO and NOx, can increase blood pressure and heart rate, leading to heart attacks, strokes, and other cardiovascular diseases.
- **Allergic Reactions:** Air pollution can also trigger allergic reactions. Pollutants such as ozone and nitrogen oxides can exacerbate allergy symptoms, including nasal congestion, eye irritation, and shortness of breath.

4. **Global Experience**

Globally, some countries are taking effective measures to reduce atmospheric pollution:

- **Norway:**

Norway has significantly reduced harmful emissions from transport by promoting and incentivizing

electric vehicles. The government offers various incentives to encourage citizens to purchase electric vehicles and is also developing the necessary infrastructure to support electric transport.

- **China:**

In China, particularly in large cities, measures are being implemented to limit the use of transport vehicles and encourage ecological transportation. The government proposes emission standards for vehicles and restrictions on the use of cars. Additionally, the production and sale of electric and hybrid vehicles are supported.

- **USA:**

In the USA, stricter environmental standards for automobiles have been introduced. The Environmental Protection Agency (EPA) has established emission limits for vehicles and improved mechanisms to monitor these pollutants. This policy has resulted in a reduction of emissions from the transport sector.

5. **Statistical Data**

- According to the World Health Organization (WHO), atmospheric pollution causes approximately 7 million deaths annually.
- The transport sector accounts for about 14% of global greenhouse gas emissions.
- In Uzbekistan's cities, transport contributes 60% to air pollution. This has significantly degraded air quality, especially in large cities like Tashkent, Samarkand, and Bukhara.

Based on this, effective measures are necessary to reduce harmful emissions from vehicles. These measures should include the widespread introduction of ecological transport and improvements to the transportation system.

Results

The research results show that automotive transport has a significant impact on atmospheric pollution. The introduction of electric vehicles and the modernization of existing vehicles based on environmental standards could be an effective way to address this issue.

Conclusion

To reduce the negative impact of automotive transport on the atmosphere, the following measures are proposed:

- The widespread introduction and promotion of electric vehicles.
- Adapting the technical specifications of transport vehicles to meet environmental standards.
- Developing public transport and reducing the use of private cars.

These measures will not only improve the ecological environment but also protect human health.

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