WEB OF SCIENTIST: INTERNATIONAL SCIENTIFIC RESEARCH JOURNAL
ISSN: 2776-0979, Volume 5, Issue 12, December- 2024

ATMOSPHERIC CHANGES IN CENTRAL ASIA AND THEIR IMPACT ON HUMAN HEALTH

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Abstract
This article analyzes atmospheric changes in Central Asia over the last 5 years and their impact on human health. It provides detailed information on air pollution, climate change, dust storms, and ecological problems. The article also discusses how these processes affect the human body, especially the respiratory system and overall health. Based on scientific statistical data, recommendations and proposals are developed.

Keywords: Central Asia, atmospheric change, climate, human health, ecological problems.

Introduction

Relevance of the Topic

The Central Asian region is one of the most climate-sensitive areas in the world. This region is facing issues such as arid climate, limited water resources, and demographic pressure. In recent years, global warming and air pollution have exacerbated these problems, causing not only economic but also social issues. For example, the increase in harmful substances in the air leads to respiratory diseases, cardiovascular problems, and weakened immunity.

Currently, atmospheric changes are causing not only local but also global problems. In particular, the ecological crisis of the Aral Sea is a major focus in the scientific world. Pollution of the atmosphere in the Aral Sea region has a negative impact on the local population, leading to an increase in chronic diseases. Therefore, studying atmospheric changes in Central Asia and assessing their impact on human health is one of the most important issues in the fields of ecology and healthcare.

Materials and Methods

The following materials and methods were used during the research:

Data sources: Meteorological observations from 2018–2023, WHO (World Health Organization) reports, and data from local ecological services.

Analytical methods: Mathematical modeling and statistical analysis were used to study changes in the composition of the atmosphere. Epidemiological research results were analyzed to assess the impact on human health.

Regional studies: Data from Uzbekistan and Kazakhstan's major industrial regions, as well as the Aral Sea ecological crisis zone, were used for evaluation.

Main Section.

Atmospheric Changes in Central Asia Over the Last 5 Years

Air Pollution

In recent years, air quality in large cities of Central Asia has deteriorated significantly. In Tashkent, Almaty, and Bishkek, the levels of particulate matter (PM2.5 and PM10), nitrogen oxides, and carbon monoxide have exceeded international standards.

According to 2021 observations, the average pollution level in Tashkent was 37 μg/m³, which is 3.7 times higher than the WHO recommended standard of 10 μg/m³.

The increase in transportation and the use of outdated technologies are the main causes of pollution.

Climate Change.

The average temperature in the region is rising by 0.2–0.3°C per year. This leads to:

- Increased droughts
- Decreased water resources
- Reduced agricultural productivity.

Ecological Crisis of the Aral Sea

The drying of the Aral Sea has drastically altered the regional climate. The rise of salt and dust particles is negatively affecting not only Uzbekistan and Kazakhstan but also neighboring countries.

In Karakalpakstan, the frequency of dust storms has reached 20–30 times a year.

Salt and chemical particles in the air are severely damaging people's respiratory systems.

Impact of Atmospheric Changes on Human Health

Respiratory Diseases

Airborne dust and harmful substances cause diseases such as asthma, bronchitis, and chronic obstructive pulmonary disease (COPD). Research conducted in the Aral Sea region shows:

40% of the population suffers from shortness of breath and other respiratory issues. The prevalence of asthma and allergic diseases in children has increased by 25%.

Cardiovascular Diseases

Harmful substances in the air narrow blood vessels and exacerbate hypertension. The incidence of heart attacks and strokes in Central Asia increased by 15% from 2019 to 2023.

Oncological and Immune System Issues

Toxic substances in the air weaken the immune system, increasing the prevalence of infectious and oncological diseases. For instance, the incidence of tuberculosis and lung cancer in the Aral Sea region is twice as high as in other parts of the country.

Measures to Prevent Negative Consequences

1. Strengthening Environmental Control:

Introducing advanced technologies in industrial enterprises to reduce waste.
Expanding the use of green energy sources.

2. Raising Public Awareness:

Increasing ecological literacy among the population.
Promoting a healthy lifestyle.

3. Enhancing Regional Cooperation:

Implementing joint programs to address ecological issues between Central Asian countries.

Results

The research shows that the deterioration of the atmosphere in Central Asia leads to:

- A significant increase in respiratory and cardiovascular diseases.
- A decline in agricultural productivity due to the region's transition to more arid conditions.
- Worsening living conditions for the population and increased ecological migration.

Moreover, the ecological crisis of the Aral Sea remains a persistent problem for the regional countries. This situation is putting an extra burden on the local healthcare system and exacerbating economic losses.

Conclusion

The Central Asian region is significantly impacted by global ecological and climate changes due to its unique natural and climatic conditions and geographical location. In the last five years, the deterioration of atmospheric composition, air pollution, climate warming, and ecological crises have had a direct and indirect negative impact on human health.

Atmospheric degradation, driven by agriculture, industry, and transportation, has led to ecological problems that affect not only the region but also the global environment. The ecological crisis of the Aral Sea is reducing the quality of life for millions of people in the region, increasing respiratory, cardiovascular, and immune system diseases. Harmful substances in the air are triggering asthma, bronchitis, and other chronic diseases, especially posing a great risk to children and the elderly.

The main problems identified during the study are:

1. Increased Air Pollution: In major cities and industrial areas, the levels of dust particles, nitrogen oxides, and other harmful gases exceed safety standards. This not only affects health but also the overall quality of life.
2. Climate Change: Rising temperatures, droughts, reduced water resources, and increasing extreme weather events are disrupting the region's ecological stability.
3. Impact of Ecological Crises on Human Health: The increase in respiratory diseases, cardiovascular problems, immune system issues, and cancer rates is directly linked to atmospheric degradation. To solve these problems, several measures should be taken:

Strengthening environmental management: It is essential to improve regional environmental legislation and strictly monitor its implementation to reduce industrial waste and improve air quality.

Strengthening public health systems to deal with the growing number of health problems linked to air pollution and climate change.

Enhancing international cooperation to tackle the regional ecological crisis and develop joint action plans for sustainable development.

In conclusion, the ecological problems in Central Asia are urgent issues that require solutions at both the national and international levels. Improving air quality will not only ensure ecological sustainability but also contribute to human health, economic stability, and the sustainable development of society.

References

1. World Health Organization reports, 2018–2023. https://www.who.int/publications
2. Jalolov, N. N., Sobirov, O. G., Kabilzhonova, S. R., & Imamova, A. O. (2023). The role of a healthy lifestyle in the prevention of myocardial infarction.
3. Central Asia Regional Ecological Monitoring Center materials. https://carececo.org
4. Kuralbayevna, S. M., Nodir o'g'li, J. N., & Mamanovna, A. A. (2024). THE ROLE OF ATMOSPHERIC AIR POLLUTION IN THE DEVELOPMENT OF RESPIRATORY DISEASES. Conferencea, 70-72.
5. Salomova, F. I., Rakhimov, B. B., Jalolov, N. N., Sultonov, E. Y., & Oblakulov, A. G. (2023). Atmospheric air of the city of Navoi: quality assessment. British Journal of Global Ecology and Sustainable Development, 15, 121-125.
6. Sultonov, E. Y., Sariullaycva, X. A., Salomova, F. I., & Mirsagatova, M. R. (2023). Ochiq suv havzalari suv namunalari tahlili. Здоровый образ жизни международная научно-практическая конференция.
7. Rahimov, B. B., Salomova, F. I., Jalolov, N. N., Sultonov, E. Y., & Obloqulov, A. G. (2023). O 'ZBEKISTON RESPUBLIKASI NAVOIY SHAHRI HAVO SIFATINI BAHOLASH: MUAMMOLAR VA YECHIM YOLLARI.
8. Абдуллаева, М. Т., Ауталипова, У. И., Ашинова, М. К., Бабаева, Г. О., Бандурина, Н. В., Бивол, Т. А., ... & Юлдашева, Ф. У. (2023). Современная наука: актуальные вопросы социально-экономического развития.
9. Саломова, Ф. И., Шеркушева, Г. Ф., Салуллаева, Х. А., Султанов, Э. Ё., & Облокулов, Л. Г. (2023). Загрязнение атмосферного воздуха города алмалык.
10. Uzbekistan Ministry of Ecology and Environmental Protection data. http://eco.gov.uz
11. Sultonov, E. Y. (2023). Short-term air pollution forecast.
12. Саломова, Ф. И., Рахимов, Б. Б., Султонов, Э. Й., & Облақулов, А. Г. (2023). Навоий шаҳри атмосфера ҳавоси сифатини баҳолаш.
13. Sultonov, E. Y., & Ismoilov, H. O. (2023). Ambient air pollution. Научный Фокус, 1(6), 41-44.
14. Sadullayeva, X. A., Salomova, F. I., & Sultonov, E. Y. (2023). OCHIQ SUV HAVZALARI MUHOFAZALASH OB'EKTI SIFATIDA. V МЕЖДУНАРОДНАЯ НАУЧНО-ПРАКТИЧЕСКАЯ КОНФЕРЕНЦИЯ «СОВРЕМЕННЫЕ ДОСТИЖЕНИЯ И ПЕРСПЕКТИВЫ РАЗВИТИЯ ОХРАНЫ ЗДОРОВЬЯ НАСЕЛЕНИЯ».

15. Salomova, F. I., & Kosimova, H. T. (2017). RELEVANCE OF STUDYING INFLUENCE OF THE BONDS OF NITROGEN POLLUTING THE ENVIRONMENT ON HEALTH OF THE POPULATION SUFFERING CARDIOVASCULAR ILLNESSES (REPUBLIC OF UZBEKISTAN). In INTERNATIONAL SCIENTIFIC REVIEW OF THE PROBLEMS AND PROSPECTS OF MODERN SCIENCE AND EDUCATION (pp. 81-83).
16. Sadullaeva, K. A., Salomova, F. I., & Sadirova, M. K. (2023). CAR WASHES AS A SOURCE OF ENVIRONMENTAL POLLUTION. Academia Repository, 4(12), 340-344.
17. Саломова, Ф. И., & Садуллаева, Х. А. (2017). Экология человека в медицинском образовании. Молодой ученый, (22), 425-427.
18. Кобилжонова, Ш. Р., & Садуллаева, Х. А. (2021). IMPACTS OF THE ENVIRONM ENT ON HUMAN HEALTH.
19. Садуллаева, Х. А., Саломова, Ф. И., Мирсагатова, М. Р., & Кобилжонова, С. Р. (2023). Проблемы загрязнения водоемов в условиях Узбекистана.
20. Миррахимова, М. Х., Садуллаева, Х. А., & Кобилжонова, Ш. Р. (2022). Значение экологических факторов при бронхиальной астме у детей (Doctoral dissertation, Россия).
21. Саломова, Ф. И., Искандарова, Г. Т., Садуллаева, Х. А., Шарипова, С. А., Шерқўзиева, Г. Ф., Нурматов, Б. Қ., & Садирова, М. К. (2022). “Атроф муҳит ва инсон саломатлиги мутахассислиги амалий кўникмаларни ўзлаштириш бўйича” услубий кўрсатма.
22. Salomova, F. I., Abdirova, A. M., & Sadirova, M. K. (2024). LIVING STANDARDS OF THE POPULATION LIVING IN THE SOUTHERN ARAL SEA REGION (USING THE EXAMPLE OF MUYNAK DISTRICT).
23. Рахимов, Б. Б., Садирова, М. К., & Ниязова, О. А. (2024). ПРОГРЕСС В МОНИТОРИНГЕ КАЧЕСТВА АТМОСФЕРНОГО ВОЗДУХА В УЗБЕКИСТАНЕ: ТЕХНИЧЕСКИЕ ДОСТИЖЕНИЯ И ИХ РОЛЬ В УПРАВЛЕНИИ ЭКОЛОГИЧЕСКОЙ ОБСТАНОВКОЙ. Conferencea, 18-20.
24. Рахимов, Б. Б., Мирсагатова, М. Р., & Садирова, М. К. (2024). ВЛИЯНИЕ МОНИТОРИНГА КАЧЕСТВА ВОЗДУХА НА ОБЩЕСТВЕННОЕ ЗДОРОВЬЕ И ЭКОЛОГИЧЕСКУЮ УСТОЙЧИВОСТЬ В УЗБЕКИСТАНЕ. Conferencea, 21-23.