JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 11, November 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

CURRENT ENVIRONMENTAL ISSUES OF ATMOSPHERIC AIR PROTECTION

M.N.Turdoliyev
Samarkand state university by named Sharof Rashidov,
University avenue 15, Samarkand, Uzbekistan
mirjalolturdaliyev322@gmail.com

Annotation: The article presents issues related to maintaining and protecting the atmosphere in a clean state, including technogenic factors that have affected the environment in recent years. It also provides information about harmful gases emitted into the air, other compounds, and waste from industrial, construction, and household enterprises.
Keywords: Atmospheric purity, protection, pollution, impact of technogenic factors on the environment, various diseases, the effect of gases on plant and animal species, mineral reserves, soil contamination, etc.

INTRODUCTION. Throughout the entire evolutionary development of humans, mankind has adapted to the natural composition of the Earth's atmosphere, and this natural composition is considered the most optimal for the human body. Maintaining atmospheric cleanliness is an integral part of environmental protection. However, in recent years, various changes have been occurring in the ratio of constant components in the atmosphere. Due to anthropogenic factors, the composition of the Earth's atmosphere has been deteriorating. This negatively affects not only human health but also hereditary diseases and the state of the environment in industrialized regions.

Changes in the gas composition of the planet’s atmosphere are becoming noticeable, with oxygen consumption increasing by more than 16 times. Therefore, its quantitative decline is being observed, while the amount of carbon dioxide (CO_2) is increasing. If in the mid-20th century the amount of SO_2 in the atmosphere was 0.028%, today this number exceeds 0.033%. The highest amounts of SO_2 emissions come from the United States, China, Japan, Germany, and other developed countries.

The increase in technogenic and natural impacts on the environment has already caused several ecological problems, the most visible of which are the negative impacts on the atmosphere, hydrosphere, and lithosphere, leading to catastrophic consequences. In atmospheric pollution, nitrogen, sulfur, and industrial emissions occupy a significant place. The main sources of atmospheric pollution are transport vehicles, industries, and thermal power plants.

Methods and materials. The concentration of toxic substances was analyzed based on monitoring results from the Samarkand Regional Hydrometeorological Service. Calculation methods and comparative analysis were used.

The main sources of air pollution in Samarkand region include large factories and enterprises such as “Pulsar group Brewery” LLC, “Bmax Building Materials” LLC, Zirabuloq gas pipelines, various shifer factories, “Samarqand don” JSC, “Jomboy-don” JSC, “Kattaqo‘rg‘on-Yog‘moy” JSC, “ASIA METAL PROF” LLC, “Maroqand sement invest” LLC, Samarkand automotive repair plants, food factories, brick factories, poultry farms, and many others.

Due to the growing demand for energy resources by industries and the population, the use of hydrocarbons, especially coal, is increasing. For example, while 3.9 million tons of coal were used in 2019, this figure reached 5.3 million tons in 2022 and 6.7 million tons in 2023. At every

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 11, November 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

stage of coal extraction, transportation, and use, pollutants are emitted into the environment, contaminating air, soil, and water resources. For instance, burning 10 tons of coal releases 220 kg of soot, 360 kg of sulfur dioxide, 64 kg of carbon monoxide, 16 kg of nitrogen dioxide, and 2 tons of ash

(Table 1).

Amount of chemical substances emitted from enterprises

Harmful substance	Average concentration of the REM component (g)	Harmful substance	Average concentration of the REM component (g)
Dust	1.1	Phenol	0.7
Sulfur dioxide	0.2	Solid fluorides	0.0
Carbon monoxide	0.3	Hydrogen fluoride	0.4
Nitrogen dioxide	0.5	Chlorine	0.7
Nitrogen oxide	0.2	Ammonia	0.3

More than 750 million vehicles are currently in use worldwide, and each emits over 200 types of harmful gases, including carcinogenic hydrocarbons and tetraethyl lead. Each car consumes large amounts of oxygen and releases harmful pollutants during its operation. Due to the addition of tetraethyl lead to fuel, cars release lead oxides, chlorides, and nitrates, forming aerosols. Coal burning emits magnesium, molybdenum, arsenic, cobalt, mercury, strontium, helium, and other substances.

Results and discussion. Due to the inability of the human body to adapt quickly to rapidly changing environmental conditions, various diseases such as cardiovascular, neurological, oncological, and allergic diseases are increasing. The release of freons and other chemicals into the atmosphere destroys the ozone layer that protects the Earth from solar radiation.

Noise pollution also negatively affects humans. The critical noise limit for humans is 85–90 decibels. This is comparable to the noise produced by a jet aircraft at close range.

Industrial, household, and construction activities release large amounts of dust, gas, aerosols, soot, and chemicals into the air. Burning 1 ton of coal releases 20 grams of sulfur and hundreds of kilograms of ash particles into the atmosphere. Harmful gases such as carbon monoxide, nitrogen oxides, and sulfur dioxide severely pollute the air.

Automobile transport accounts for 65–70% of harmful pollutants in urban air. In Samarkand city alone, there are over 200,000 cars, each emitting more than 200 harmful compounds. A single car consumes 4 tons of oxygen and emits 500 kg of carbon monoxide, 40 kg of nitrogen oxides, and several other pollutants annually.

Air pollution in Samarkand includes dust, nitrogen oxides, chlorine, carbon oxides, hydrogen fluoride, phenol, and other hazardous substances. Nitrogen oxides cause respiratory diseases in

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 11, November 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

children, while sulfur gases affect eyesight, hearing, and the respiratory system. Carcinogenic substances damage the nervous and reproductive systems and disrupt metabolism.

The greenhouse effect is increasing Earth's average temperature, melting glaciers, and causing sea levels to rise, which could lead to climate migration. Air pollution also harms city vegetation, damaging leaves, reducing photosynthesis, and weakening plant health. For example, trees in cities live significantly shorter lives than those in forests.

Animals are also affected. Polluted air causes respiratory diseases and internal organ damage in livestock. Bees are particularly sensitive to air pollution.

An average human breathes 600,000 cubic meters of air in 70 years. Polluted air significantly shortens life expectancy. Increasing oxygen consumption and pollution disrupt the natural balance between oxygen production and use.

Air pollution also causes economic losses, damaging buildings, metals, fabrics, paper, and historical monuments, including Samarkand's ancient heritage. High carbon dioxide levels accelerate the erosion of limestone structures.

Photochemical smog disrupts transportation and aviation. As American scientist Lewis Batton stated: "Either people will reduce pollution or pollution will reduce the number of people on Earth."

Conclusion and recommendations. Literature shows that airborne and waterborne pollutants negatively affect human health. The inconsistency of data in existing studies indicates the need for further research. Green areas are among the most effective ways to combat air pollution. Green plants act as natural filters, trapping dust and absorbing gases. One hectare of trees absorbs 220–280 kg of CO_2 and releases 180–220 kg of oxygen per sunny day.

REFERENCES

1. Mirziyoyev Sh.M. We will build a great future together with our brave and noble people. Tashkent, "Uzbekistan" publishing house, 2017.
2. Izzatullayev Z.I., Botyrov Kh.F., Fayzullayev B.F. Fundamentals of ecology. Samarkand, "Zarafshon" publishing house, 2019, 237 p.
3. Baratov R. Nature protection. Tashkent, "O'qit" publishing house, 1991.
4. Rahimova T.U., Rahimova Sh.D. Didactic foundations of teaching ecology to students. "Public Education" magazine, No. 2, 2015.
5. Handbook of the Ecologist-Expert. N.V. Koroleva, I.G. Fakhrutdinov, K.V. Anan'eva, G.V. Perevozchikov, R.H. Mansurov. Goskomprirody Respubliki Uzbekistan, Tashkent. 1997. - 435 p.
6. Guide to the Ecologist-expert. Khabirov R.S., Koroleva N.V., Ishmukhamedov T.R. Tashkent: Goskompriroda, Gosekoekspertiza, OOO Koni-Nur», 2009, 528 p.
7. Domuladzhanov I.Kh., Kholmirzaev Yu.M., Domuladzhanova Sh.I. Operation of the surrounding environment at the parking lot. Journal "Universum: technical science" No. 4(73) 25.04.20, No. 18, Izd. "MTsNO", 2020.- p. 1-4.