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THE PROBLEM OF AIR POLLUTION IN THE CAPITAL OF UZBEKISTAN

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Abstract

Air pollution has become one of the most pressing environmental issues in the modern world. In this context, the current problem of air pollution in the capital of the Republic of Uzbekistan is examined. Air pollution due to river clogging, which brings toxins, chemicals, and pathogens that contribute to the spread of dangerous infectious diseases, is investigated. Air quality index indicators for the capital of the republic are also examined, and the city's air pollution level is analyzed in the ranking of the most polluted cities in the world.

Keywords

Air quality, dust storm, heavy metals, noncommunicable diseases, WHO European Region, air quality index, extreme weather conditions, black carbon, damaged nature.

INTRODUCTION

Air pollution is now a global phenomenon and poses a major threat to the survival of the human population. Air pollution adversely affects human health, causing an increase in respiratory and digestive diseases, as well as allergies. Most worryingly, air pollution is also contributing to an increase in cancer (malignant tumors).

As a rule, the state of the environment largely determines human life expectancy, health, productivity, and much more. In this context, it's important to note that water resources are becoming increasingly polluted, which in turn pollutes the air. Rivers carry toxins, chemicals, and pathogens. This situation deteriorates the health of people worldwide and threatens quality of life. Air pollutants cause respiratory diseases such as asthma, allergic rhinitis, cardiovascular problems, and other ailments. High temperatures also contribute to the spread of infectious diseases.

LITERARY RESEARCH

It's common knowledge that the number of countries with deteriorating air quality is growing every year. Currently, countries with air pollution levels exceeding all acceptable limits include Afghanistan, Nigeria, Vietnam, Bangladesh, Pakistan, Nepal, India, and China. In these countries, in addition to problems with waste disposal and a lack of high-quality drinking water, the population suffers from droughts and sandstorms, which harm both rural and urban residents. Almost all of these countries suffer from high population density, and a large proportion of the population lives below the poverty line. The environmental situation in these countries has long been out of control. Forecasts for the environmental future of these countries are extremely negative.

In this context, I would like to highlight the level of air pollution in the capital of the Republic of Uzbekistan. In recent years, as in other countries, a sharp deterioration in air quality has been observed throughout Uzbekistan. It is no secret that the inhalation of such dusty air has led to a sharp increase in the number of people seeking medical attention for shortness of breath, itchy eyes, and worsening health. Below, we review and analyze emergency situations that have occurred in the capital of the Republic of Uzbekistan.

In a study by climatologist E. Abdulakhatov [1], an example of air pollution in the city of Tashkent is presented. According to the author, the dust storm that engulfed the city of Tashkent and the Tashkent region from November 4-8, 2023, was the first such event in 150 years. The adverse weather conditions negatively impacted the health of many people. No state of emergency was declared during the natural disaster, and not all services responded equally. The emergency was not covered on the Ministry of Emergency Situations' website or on their Telegram channel. However, the ministry does conduct training sessions and workshops on how to respond to similar dust emissions or dust storms. They even developed tactics for how people should navigate dusty areas. The scientist noted that the government failed to take adequate measures during the air pollution outbreak, which not only led to difficulties for the population but also ignored a number of scientific aspects that should have been studied. The researcher also commented on the Ministry of Innovation's statement that dust in the air is harmless. As is well known, "Dispersed particles in dust are considered harmful to public health throughout Russia and in European countries. I wonder why the Ministry of Innovation claimed dust is harmless. A dust particle itself is harmful because it inflames and damages the respiratory system. Respiratory diseases follow. After laboratory testing, they said the chemical composition did not contain heavy metals. But if they were talking about whether it negatively impacts human health, they should have provided facts. He further notes that the dust was declared harmless. The damage was already done, and everyone knew it. The hydro meteorologist recalled that during the dust storm, it was reported that 4,000-5,000 people called ambulances due to shortness of breath, but most were simply breathing in the dust.

According to the source [2], since 1995, life expectancy in Uzbekistan has increased by approximately five years. However, this indicator is still one of the lowest in the WHO European Region. The same applies to maternal, neonatal, and under-5 mortality rates in Uzbekistan, which have decreased but remain among the highest in the WHO European Region. Noncommunicable diseases (NCDs) continue to account for the majority of deaths and years of life lost in the country. Exposure to environmental factors such as air pollution and noise contribute to high blood pressure and low birth weight, which are among the most important risk factors for NCDs in the country, along with diet, child and maternal under nutrition, and tobacco use. The incidence and prevalence of certain infectious diseases, such as tuberculosis, in particular multidrug-resistant tuberculosis, remain a concern. Tuberculosis incidence rates, which began to decline steadily around 2005, remain twice as high as in the WHO European Region. The Republic of Karakalpakstan and the Tashkent Region have the highest tuberculosis incidence in the country. The source further notes that environmental health risks and hazards remain high. In 2016, the annual mortality rate from indoor and ambient air pollution was estimated by WHO to be 81.1 cases per 100 000 population, ranking the country fifth in the WHO European Region for this indicator. The burden of diarrheal diseases caused by poor water, sanitation, and hygiene was estimated at approximately 14 860 disability-related life years in 2016, ranking the country sixth in the WHO European Region for this indicator.

Based on data from channel [3], we can confirm that Tashkent, the capital of Uzbekistan, has exceeded all acceptable limits for air pollution in the global ranking of the most polluted cities (Fig. 1). As can be seen, the average air quality index (AQI) on March 1, 2024, was 216 units, which is considered very harmful (heavily polluted) for all segments of the population. This level of air pollution surpasses that of countries such as Pakistan, Bangladesh, Uganda, and Kyrgyzstan.

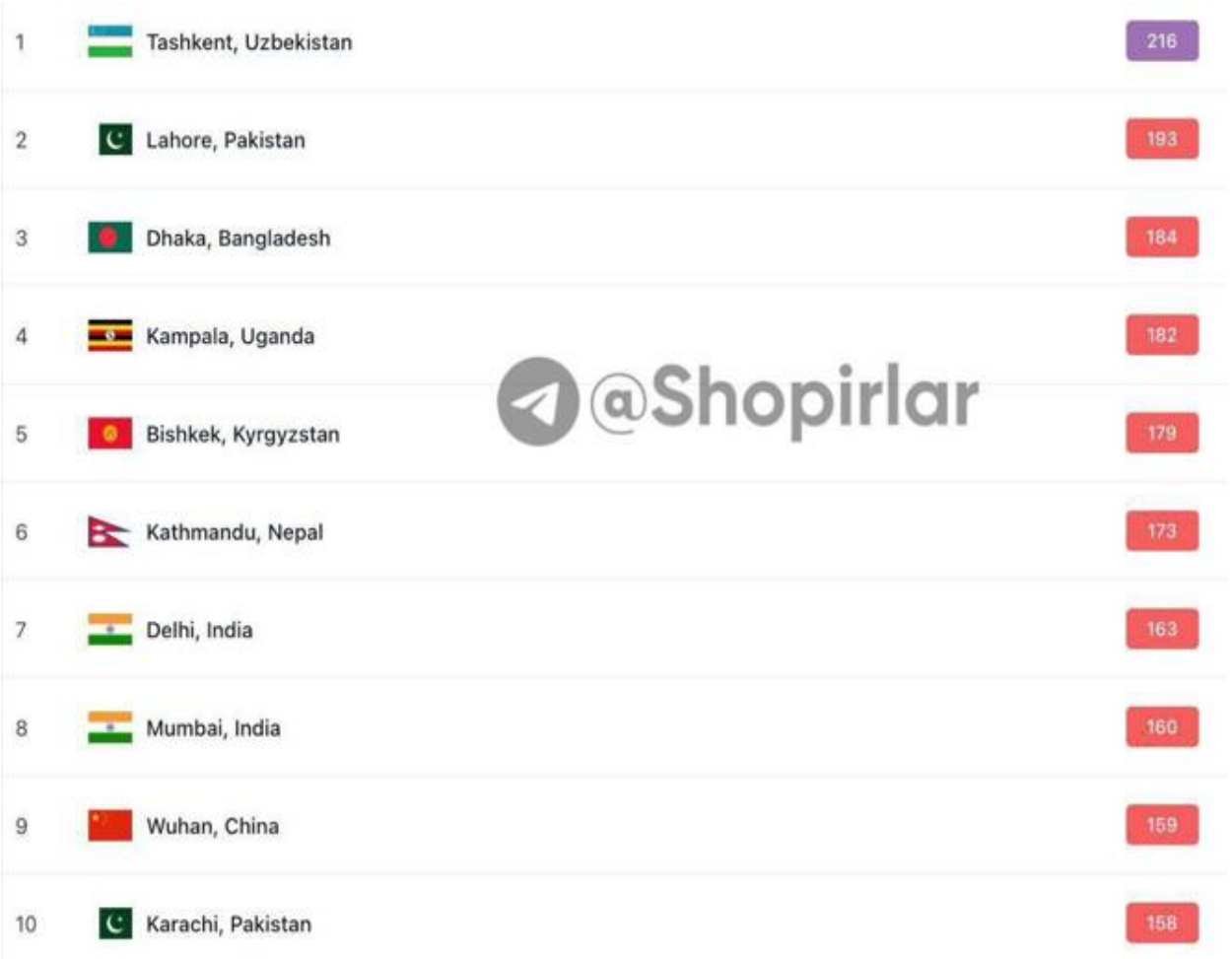

Figure 1. Illustration of the most polluted cities in the world (March 1, 2024).

The website [4] notes that, due to climate change, the country is increasingly experiencing extreme weather conditions, dust storms, abnormal winters, and droughts during scorching summers. It also notes that the country's authorities, concerned about such high levels of air pollution and its negative impact on human health, are taking steps to reduce the damage. In 2023, a ban on new construction was introduced, which will last until the city's general plan is approved.

Based on data from the website [5], we can conclude that the AQI index in the capital of Uzbekistan (Tashkent) has risen to first place in the ranking of the most polluted cities in the world. It also notes that on March 1, 2026, the AQI index in the capital reached a "very hazardous" level (Figure 2). Uzhydromet reported that this occurred due to a weather inversion.

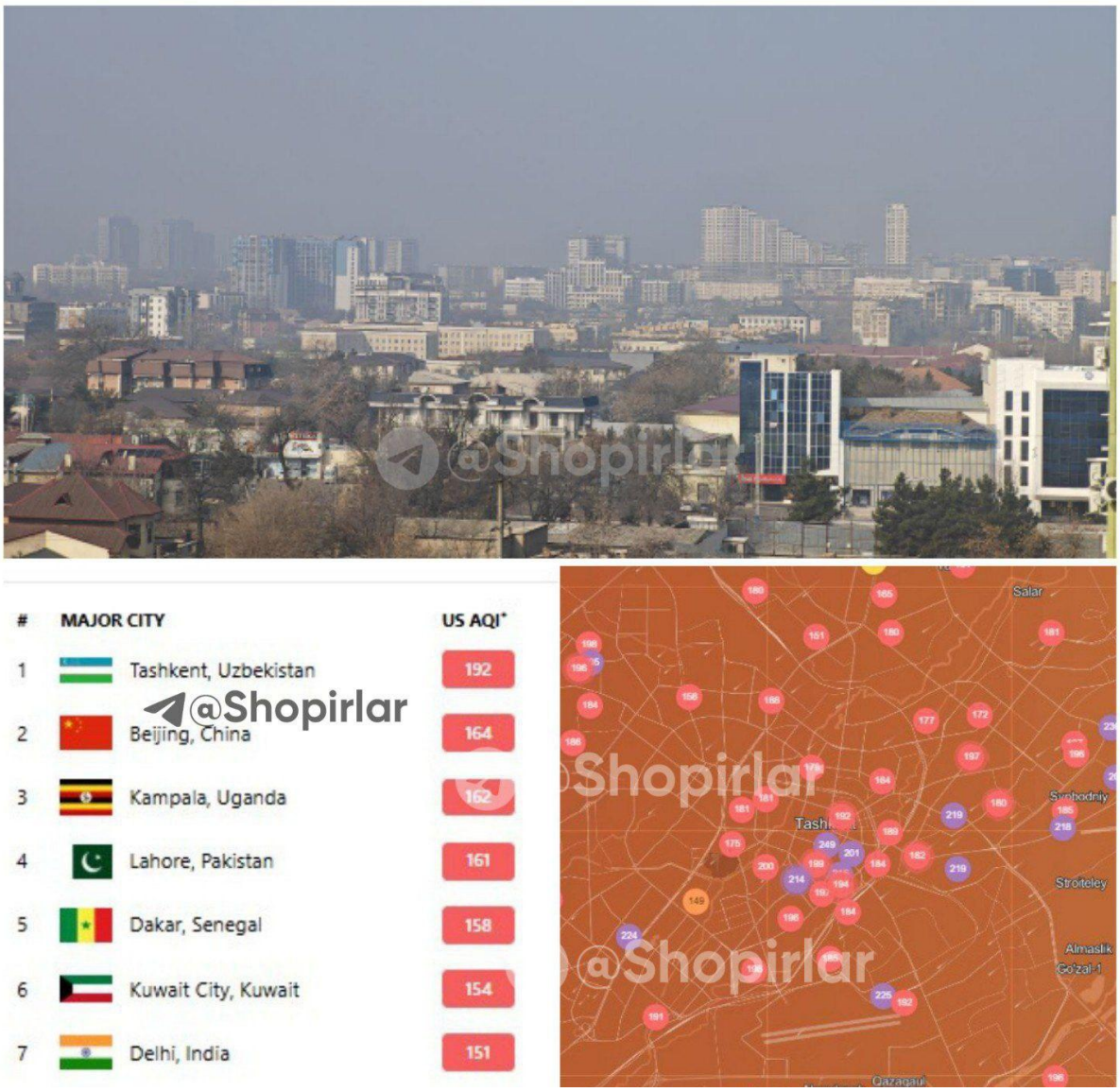

Figure 2. Illustration of pollution levels in the world's most polluted cities in the global ranking (March 1, 2026).

It should be noted that between March 1, 2024, and March 1, 2026, the capital of Uzbekistan (Tashkent) consistently held the top spot in the global ranking of the most polluted cities. Data on unfavorable situations related to air pollution are provided in a number of sources, which are illustrated by the AQI in the ranking of the most polluted cities in the world.

Methodology

It should be noted that air pollution in the modern world has become one of the most pressing environmental problems of the 21st century, significantly affecting global warming and climate change. Furthermore, particulate matter, such as black carbon, absorbs solar radiation and alters cloud formation processes, amplifying regional and global temperature increases. The industrial

sector, transport, deforestation and fossil fuel combustion remain the leading sources of air pollution worldwide.

Central Asian cities have repeatedly been ranked among the most polluted cities in the world based on air quality. The most critical pollution situations are in Tashkent, Almaty, Dushanbe, and Bishkek. Overall, air pollution conditions across Central Asia are quite similar. Air quality is primarily caused by transportation—this includes aging vehicle fleets and transportation in general—and, during the autumn and winter heating season, by combined heat and power plants, boiler houses, private households without gas, and small businesses (e.g., bathhouses and waste processing plants). Estimating the potential health impact of air pollution in Central Asian countries is only possible very roughly. Nevertheless, the World Health Organization predicts that, if current rates of economic growth and medical advancement continue, the overall deterioration of the environmental situation between 2030 and 2050 will cause an additional 250,000 deaths worldwide annually. This is a forecast; deviations are always possible, and given the current rate of pollution, we can expect a bleak situation. It's difficult to predict how much of this figure will fall on Central Asian countries, including the capital of Uzbekistan.

It's no secret that clean air around populated areas is almost completely disappearing, rivers are turning into sewers, garbage piles, landfills, and a devastated natural environment are everywhere – this is the stark picture of the relentless industrialization of the modern world. Air pollution is the most serious environmental problem facing modern cities, causing significant damage to the health of residents and green spaces. The atmosphere above large cities contains 10 times more aerosols and 25 times more gases. Motor vehicles account for approximately 60-70% of this gas pollution. Overall, vehicle emissions are significantly more toxic than those from stationary sources. Along with carbon monoxide, nitrogen oxides, and soot (in diesel vehicles), a running vehicle releases more than 200 toxic substances and compounds into the environment. Among these, heavy metal compounds and certain hydrocarbons, particularly benzopyrene, which has a pronounced carcinogenic effect, are particularly noteworthy.

Research shows that countries with rapidly expanding industrial production are more likely to experience serious problems with declining air quality, which, in turn, accelerates global warming. Despite international agreements such as the Kyoto and Paris Protocols, environmental degradation continues globally, increasing the risks of respiratory and cardiovascular diseases. Experts say that agreeing to reduce emissions remains a global challenge due to economic, political, and technological barriers. Effective solutions require integrating renewable energy sources, improving energy efficiency, transitioning to sustainable transport, and improving regulatory frameworks.

CONCLUSION

From all of the above, it becomes clear that the rising trend in air pollution in the capital of the Republic of Uzbekistan is deplorable, negatively impacting public health, especially the health of the younger generation. In this regard, it should be noted that for millennia, humans have lived, worked, and developed, but they never imagined that the day might come when it would become difficult, if not impossible, to breathe clean air, drink clean water, or grow anything because the air is polluted, the water is poisoned, and the soil is contaminated with radiation or other chemicals. These factors pose a real threat to all humanity, and especially to the younger generation.

Thus, it can be concluded that the growing severity of threats to human civilization in the form of a number of global problems, including air pollution, poses a grave danger to the human population. To solve this problem, peoples of all countries must consolidate all their resources for the sake of survival on planet Earth.

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