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THE IMPACT OF TRANSITIONING TO A GREEN ECONOMY ON HUMAN  
HEALTH: GLOBAL TRENDS AND THE CONTEXT OF UZBEKISTAN

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**Annotatsiya:** Ushbu maqolada yashil iqtisodiyotga o‘tish (qayta tiklanuvchi energiya, energiya tejamkorligi, “yashil” transport, chiqindilarni kamaytirish, resurslardan oqilona foydalanish) jarayonining inson salomatligiga ta’siri tahlil qilinadi. Adabiyotlar sharhi asosida eng katta sog‘liq foydasi havo ifloslanishini, xususan PM2.5 darajasini kamaytirish orqali yuzaga kelishi, iqlim o‘zgarishi bilan bog‘liq issiq to‘lqinlar, qurg‘oqchilik va ekstremal hodisalar xavfini pasaytirishi, shuningdek, faol transport va yashil shaharsozlik orqali surunkali kasalliklar profilaktikasiga hissa qo‘shishi ko‘rsatib beriladi. O‘zbekiston misolida Toshkent shahrida PM2.5 ifloslanishi bilan bog‘liq salomatlik yuki sezilarli ekani hamda Aralbo‘yi hududlarida chang bo‘ronlari va ekologik degradatsiya sog‘liq risklarini kuchaytirishi qayd etiladi. Maqolada yashil o‘tish jarayonida yuzaga kelishi mumkin bo‘lgan xatarlar (adolatli o‘tish, elektron chiqindilar, ishlab chiqarish zanjirlari) va sog‘liq ko-foydalarini maksimal oshirish bo‘yicha amaliy tavsiyalar keltiriladi. **Kalit so‘zlar:** yashil iqtisodiyot; jamoat salomatligi; PM2.5; havo ifloslanishi; iqlim o‘zgarishi; issiqlik stressi; Aralbo‘yi; energiya tejamkorligi.

**Аннотация:** В статье анализируется влияние перехода к «зелёной» экономике (возобновляемая энергетика, энергоэффективность, низкоуглеродный транспорт, сокращение отходов, устойчивое управление ресурсами) на здоровье населения. На основе обзора международных отчётов и научной литературы показано, что наибольший краткосрочный эффект для здоровья связан со снижением загрязнения воздуха, прежде всего концентраций мелкодисперсных частиц PM2.5. В долгосрочной перспективе меры по смягчению последствий изменения климата и адаптации способны уменьшить риски, связанные с волнами жары, засухами и другими экстремальными явлениями. Дополнительные «сопутствующие выгоды» обеспечивают активная мобильность и «зелёное» градостроительство, способствующие профилактике неинфекционных заболеваний. Для Узбекистана отмечается значимая нагрузка на здоровье, обусловленная PM2.5 в Ташкенте, а также повышенные риски в Приаралье, связанные с пыльными бурями и деградацией экосистем. Рассматриваются возможные риски переходного периода (принципы справедливого перехода, электронные отходы, производственные цепочки) и предлагаются практические рекомендации по максимизации преимуществ для общественного здоровья.

**Ключевые слова:** зелёная экономика; общественное здоровье; PM2.5; загрязнение воздуха; изменение климата; тепловой стресс; Приаралье; энергоэффективность.



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**Abstract:** This article examines how the transition to a green economy—renewable energy, energy efficiency, low-carbon transport, waste reduction, and sustainable resource management—affects human health. Based on international reports and peer-reviewed literature, the largest near-term health gains are expected from reducing air pollution, particularly fine particulate matter (PM<sub>2.5</sub>). Over the longer term, mitigation and adaptation measures help reduce climate-related health risks such as heatwaves, droughts, and other extreme events. The paper also highlights additional co-benefits from active mobility and green urban planning, which can reduce the burden of non-communicable diseases. For Uzbekistan, evidence suggests a substantial health burden from PM<sub>2.5</sub> in Tashkent, while the Aral Sea region faces elevated risks related to dust storms and ecosystem degradation. Finally, the article discusses potential transition risks (just transition, e-waste and battery chains, and policy trade-offs) and provides practical recommendations to maximize public-health benefits.

**Keywords:** green economy; public health; PM<sub>2.5</sub>; air pollution; climate change; heat stress; Aral Sea region; energy efficiency.

### **Introduction**

The transition to a green economy refers to aligning economic growth with reduced carbon emissions, efficient resource use, and improved social welfare without harming the environment. This process is not limited to ecological benefits; it also delivers direct health co-benefits. In particular, reducing fine particles (PM<sub>2.5</sub>) and other pollutants produced by burning fossil fuels can lower morbidity and premature mortality even in the short term.

### **Research Methodology**

This paper draws on secondary data sources: WHO fact sheets and thematic pages, the Lancet Countdown global reports, the World Bank's assessment of air quality in Tashkent, Uzbekistan's Strategy for Transition to a Green Economy (2019–2030), and peer-reviewed reviews on dust storms and health problems in the Aral Sea region. The results compare global evidence with risks specific to Uzbekistan.

### **Health Gains from Reducing Air Pollution**

According to WHO, the combined effects of ambient and household air pollution are associated with millions of premature deaths each year, with major causes including stroke, ischemic heart disease, lung cancer, and acute/chronic respiratory diseases. Green energy (solar, wind), energy-efficient housing and clean heating, and reduced transport emissions decrease pollutants such as PM<sub>2.5</sub> and NO<sub>2</sub>, thereby lowering the health burden.

### **Climate Change Risks and Adaptation**

Climate change increases the frequency and intensity of extreme events such as heatwaves, wildfires, floods, and droughts. According to the WHO fact sheet, between 2030 and 2050 climate change is expected to cause about 250,000 additional deaths per year through undernutrition, malaria, diarrhea, and heat stress. Lancet Countdown reports also emphasize that heat-related health risks have reached record levels in recent years. Alongside mitigation, adaptation is essential: health systems and urban infrastructure must be prepared for heat and other climate hazards.



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### **Preventive Effects of Active Transport and Green Urban Planning**

Green transport policies—public transit, cycling and walking infrastructure, electric cars and buses—produce a double dividend: (1) air pollutants and noise decline; (2) physical activity increases, reducing risks of obesity, type 2 diabetes, and cardiovascular disease. Green urban planning (trees and green spaces, shaded areas, heat-mitigating materials) helps reduce heat stress and psychological strain.

### **Uzbekistan: Air Quality and Health Burden in Tashkent**

The World Bank’s “Air Quality Assessment for Tashkent” report shows that PM2.5 pollution causes substantial damage to health and the economy in Tashkent. Based on 2019 data, the number of PM2.5-related premature deaths is estimated to be around 3,000 per year. The sharp winter increase in PM2.5 suggests a stronger role of residential and commercial heating sources. It is also noted that on May 21, 2024 Uzbekistan’s Ministry of Health adopted a PM2.5 standard for indoor (residential) air, an important step toward better air-quality management .

### **Aral Sea Region: Dust Storms and Long-Term Health Risks**

Scientific reviews indicate that ecological degradation in the Aral Sea basin and salt-dust particles lifted from the dried seabed can increase risks of respiratory diseases, allergies, and other health problems . Systematic reviews also report that dust storms have both acute (short-term) and chronic (long-term) effects associated with cardiovascular and respiratory diseases . Therefore, in Uzbekistan the green transition should be linked with ecological restoration measures (land and water management, reducing desertification, controlling wind erosion and dust).

### **Potential Risks During the Green Transition**

Although the transition to a green economy is broadly positive, if certain risks are not managed they may harm health and social well-being: (a) the “just transition” issue—job losses in some sectors can increase stress and social problems; (b) batteries and e-waste—without adequate recycling, risks of heavy-metal exposure rise; (c) misguided biomass policies—if smoky fuels spread as a “cheap” heating option, indoor pollution increases; (d) insufficient climate adaptation—occupational safety risks for outdoor workers during heatwaves.

### **Practical Recommendations**

To capture health co-benefits faster in Uzbekistan and its cities, the following priorities are key: 1) improve energy efficiency in housing and social facilities and scale clean heating technologies; 2) strengthen public transport, reduce congestion and emissions, and expand cycling/walking infrastructure; 3) broaden PM2.5 monitoring and ensure enforcement of adopted standards; 4) control dust in the Aral Sea region and expand green areas (e.g., protective forest belts) and soil restoration programs; 5) regulate collection and recycling chains for e-waste and batteries; 6) strengthen health-system preparedness for climate risks (heat, water scarcity).

### **Direct Health Impacts of Green Transition Measures (Brief)**

Sector	Green measure	Health outcome
Heating and housing	Energy-efficient homes,	PM2.5 decreases;



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	clean heating, reduced solid-fuel use	cardiopulmonary risks decline
Transport	Public transport, electric transport, reduced congestion, cycling infrastructure	Air pollution and noise decrease; physical activity increases
Energy	Solar/wind power, grid modernization, reduced share of coal/fuel oil	SO2 emissions decrease; health burden declines
Urban planning	Green spaces, heat-mitigating infrastructure, shaded corridors	Heat stress and psychological strain decrease
Ecosystems and land-water	Reducing desertification, dust control, soil restoration	Health impacts of dust storms decrease

**Conclusion**

Transitioning to a green economy delivers rapid and tangible health benefits primarily by reducing air pollution. Over the longer term, it helps lower risks related to climate-change-driven heat stress, ecological degradation, and threats to food security. In Uzbekistan, key public-health priorities include reducing PM2.5 levels in Tashkent (clean heating; controlling transport and industrial emissions) and implementing comprehensive measures against dust and land degradation in the Aral Sea region. At the same time, just-transition principles, waste management, and adaptation policies should be implemented as part of the same package of green reforms to maximize health co-benefits.

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