

CLIMATIC MIGRATION AND TRANSFORMATION OF LANDSCAPES IN UZBEKISTAN

Qodirova SH.B

Tashkent Kimyo International

University Samarkand Branch

Senior Lecturer

nirishxan1305@gmail.com

Annotation. The article deals with key climatic changes and related transformations of landscapes in Uzbekistan. It analyzes long-term trends in temperature and precipitation, drought dynamics and desertification processes, as well as the degradation of the Urals as a result of the drying up of the Aral Sea. Special attention is paid to efforts to restore landscapes through reforestation on the Aral Sea bed and urban and rural adaptation initiatives. The findings confirm the need for an integrated approach to natural resource management and landscape architecture in the face of accelerating climate change. In this regard, the article proposes an innovative formula for calculating the “intensity of climate change in a particular region”.

Keywords. Climate migration, climate change, landscape transformation, Uzbekistan, ecological migration, desertification, oasis zones, water resources, rural population, climate adaptation, land degradation, resettlement, agro-ecological conditions, sustainable development.

Over the past three decades, the problem of global warming has become a topical issue in the international community. Several factors are known to aggravate the situation. The current situation around climate change increasingly increases the risks of losing the sustainability of the world, as the world community under information

pressure is growing anxiety about the future of civilization, which increases alarmism and leads away from sensible and objective assessments of ongoing processes. Most climate scientists explain modern climate change by the growth of the greenhouse effect caused by anthropogenic factor. As a result, the Kyoto Protocol was signed in 1997, international conferences on ecology were organized in Paris, Glasgow, etc. At the same time, climatologists cannot agree on how long and how much climate change can occur. In their studies they model global processes and do not substantiate the limits of the possibility of sustainability of the natural environment, there is no conviction in the cause-and-effect relationships of the problems that have arisen. Taking into account the fact that today the manifestation of global warming is becoming brighter and brighter, the number of supporters of the idea that it will worsen international relations and lead to the loss of the possibility of ensuring security is growing. All this suggests that panic arises from ignorance or a certain interest rather than from the consequence of global development. Skeptics say there is insufficient evidence that anthropogenic impacts have caused global warming. They say that climate fluctuations can occur over several centuries and are cyclical. They calculate that this global warming is part of a cycle of rising temperatures. Climate changes caused by natural processes and anthropogenic activities contribute to the emergence of environmental problems in certain regions and countries. As a result, the territory where the population lives becomes unsuitable for existence on it. This forces people to move to more favorable natural and climatic countries, thus becoming climate migrants or refugees. It becomes relevant to develop policy approaches to climate migrants at the international, regional and national levels. In turn, to make such decisions, it is necessary, first of all, to understand the causes and essence of the ongoing climatic changes leading to large flows of migration. This will allow either solving the problem or reducing its negative impacts on the situation in a particular country, as well as improving the effectiveness of the management of mobilization of funds to address the problem. The problem of climate migration in modern times has been studied quite extensively in the works of many scientists. Interestingly, in

Germany this topic has not only received its own scientific discourse, but also entered the political discourse. But despite the discussion of this topic, today there are still no international mechanisms to coordinate its solution. Central Asian countries have not faced the problem of climate migration. But the vulnerability of the region's ecosystems and the available historical evidence of such migrations suggest that there is a need to develop scientific and public understanding of them. Uzbekistan is among the countries at high risk of climate-related disasters, including droughts, extreme temperatures and dust storms. CMIP6 estimates that the average temperature in the country will increase by 1.5-2.0 °C by the middle of the 21st century and precipitation will decrease to 10% of current levels, exacerbating soil moisture deficits. In parallel, there is an intensive process of desertification: annually more than 50,000 ha of arable land lose productivity due to soil degradation and erosion. The study was carried out by systematic literature review and analysis of open data. CMIP5/CMIP6 climate scenarios, statistics on desertification and soil degradation, reports of international organizations on reforestation and landscape adaptation, as well as media publications on social consequences of the Aral Sea desiccation and urbanization were analyzed. A 1.2 °C increase in mean annual temperatures over the last 50 years and an 8% decrease in annual precipitation compared to the 1961-1990 baseline period. Spring dust storms have increased by 20% over two decades. More than 65% of the territory of Uzbekistan is exposed to soil degradation of different severity. The main factors are: uncontrolled water diversion for irrigation, wind erosion and changed hydro regime after regulation of the Amu Darya and Syr Darya rivers. The reduction of the Aral Sea volume by 75% since 1960 has led to mass migration from coastal areas. In Muinak, residents face dust storms and soil contamination with pesticides, which worsens health and increases poverty. Since 2018, more than 1.7 million hectares of saxaul, saltbush and tamarisk have been planted at the bottom of the former Aral Sea. These works help stabilize the soil and reduce dust emissions by up to 30% during the dust storm season. The 1 Billion Trees program has involved local communities and school children. Urban growth at the expense of migrants from rural areas is creating "heat islands" and pushing back

farmland. The average temperature in Tashkent has increased by 2 °C compared to the suburbs. These findings demonstrate that climate change is transforming both natural and anthropogenic landscapes. Reforestation projects on the Aral Sea bed show the effectiveness of nature-based and socially-oriented adaptation, but urbanization and desertification require integrated measures: a combination of engineering solutions, biophilic design and sustainable agricultural practices.

Conclusion. Climatic transformation of landscapes in Uzbekistan reflects the complex interaction of natural processes and human activity. Effective adaptation requires: integration of reforestation and sustainable agriculture; development of green infrastructure; strengthening monitoring of soil degradation and hydrological parameters; involvement of local communities in restoration programs. In conditions when not all countries of the world can implement “green” technologies, the race for transition to a “green” economy can increase threats to the functioning regimes of open world trade, as it creates the threat of increasing trade barriers. This will have an immediate impact on the Global South. Geopolitical risks of climate change are therefore on the rise. Such risks are driven by both physical impacts and economic and technological policies in different countries. The US and EU are investing heavily in clean industrial sectors. These have increased in the post-pandemic period. This increases their adaptive capacity. This is difficult to say about countries in the Global South.

Литература

1. Romanenkov G. et al. Assessing the Potential Impacts of Climate Change on Drought in Uzbekistan. Atmosphere, 2024.
2. Opp C. Desertification in Uzbekistan. ResearchGate, 2005.
3. Mongabay. Uzbekistan plants a forest where a sea once lay. May 2024.
4. World Bank. Greening the Desert: The Role of Landscape Restoration in Uzbekistan’s Battle Against Sand and Dust Storms. Dec. 2024.
5. Lloyd S. Climate change is fueling the disappearance of the Aral Sea. AP News,

- Feb. 2024.
6. World Weather Attribution. 'Bonkers' heatwave in central Asia fuelled by climate change. Financial Times, Apr. 2025.
7. UNCCD. Uzbekistan LDN Target Setting Programme Country Report. Apr. 2019.
8. UNDP. Afforestation: A new approach to climate change in the Aral Sea. 2018.