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HUMAN IMPACT ON NATURE: THE CASE OF DESERTIFICATION

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Abstract: This article analyzes the negative impact of human activities on the natural environment, with a particular focus on land resources, using desertification as an example. Desertification is a process in which lands, primarily in arid and semi-arid regions, lose their ecological and economic value due to degradation, a phenomenon often intensified by anthropogenic factors. The study highlights how human activities—such as deforestation, improper land use, overgrazing, and unscientific irrigation practices—contribute to desertification. Furthermore, the article examines the socio-economic consequences of this environmental problem, its impact on local livelihoods, and proposes sustainable solutions to mitigate its effects. The research underscores the importance of human responsibility in combating desertification.

Keywords:desertification, land degradation, UNEP, sustainable development framework, forest reclamation, chain reaction.

Introduction

Currently, one of the most serious ecological, social, and economic challenges facing humanity is the process of desertification. Desertification refers to the combined effect of natural, geographical, and anthropogenic factors that lead to the degradation of landscapes and ecosystems in arid regions, resulting in the decline of organic life forms (from the French term *dégradation*, meaning gradual deterioration) and a reduction in the natural and economic potential of these territories. This process significantly affects the living standards and health of the population and ultimately leads to migration.

The issue of combating desertification was first addressed at the global level during the United Nations International Conference held in Nairobi in 1977, where a program to combat desertification was adopted.

The development of desertification depends on the interaction of natural and anthropogenic factors, as well as the specific natural and economic conditions of a region, with one of these factors potentially becoming dominant. Natural factors create the necessary conditions for desertification to develop under certain circumstances. However, desertification is predominantly anthropogenic in nature and leads to serious socio-economic and political consequences. Approximately 33% of the Earth's land area is at risk of desertification, with 70% of arable lands in dry regions already affected.

Desertification became particularly acute between 1968 and 1973 in the Sahel zone, south of the Sahara Desert in Africa, where prolonged drought caused catastrophic damage. This process severely affected the economic and social sectors of many African countries. Pastures and

rainfed agriculture suffered, millions of livestock perished due to feed shortages and water scarcity, and crop yields dramatically decreased.

Over the past 40 years, desertification has been recognized as a major part of global environmental protection challenges and one of humanity's pressing global problems. Its potential impacts threaten more than 110 countries across Asia, Africa, and South America. Annually, desertification destroys approximately 50,000 km² of land. According to UNEP, the economic losses caused by desertification amount to 42 billion USD annually, while the direct social impacts are even higher.

UNEP reports further indicate that each year 12 million people become "environmental refugees" due to desertification and drought, with over 135 million people facing forced migration risks, a figure that is likely to increase. Globally, 17 million hectares of fertile land are lost each year—equivalent to 25 hectares per minute. Over the past 300 years, desertification has manifested on 87% of the Earth's land surface, with 54% of this occurring in the last 100 years. This process continues actively in Southeast Asia and Africa. If it continues at the current pace, by 2050, up to 95% of the Earth's land may become unsuitable for use.

The severity of desertification and its impact on the natural environment is intensifying year by year. By its nature, this problem has global significance, affecting the economic and social interests of all humanity. In studying desertification and combating its effects, the documents adopted at the United Nations Conference on Environment and Development held in Rio de Janeiro from July 3–14, 1992, play a crucial role. The conference established a global framework for addressing ecological challenges and shaping environmental policies. Representatives from over 160 countries, more than 1,500 experts, scientists, and state leaders participated in the conference, resulting in key international documents on sustainable development. It was concluded that humanity could no longer follow traditional development models and must transition to a "sustainable development model." Additionally, the "21st Century Sustainable Development Agenda" was adopted, outlining global development principles and criteria for the 21st century.

The issue of combating desertification and drought has been included as a special Chapter 12 on the agenda of the 21st century. At the conference, the necessity of adopting a UN Convention to combat desertification was proposed. Currently, more than 150 countries worldwide have ratified the convention, and June 17 has been declared the "International Day to Combat Desertification."

Most of the territories of Central Asian countries are located in arid regions; therefore, they joined the convention and immediately began developing their national action programs. The Republic of Uzbekistan signed the UN Convention to Combat Desertification on December 7, 1994.

Short-sighted and irrational use of water resources ultimately led to the shrinkage of the Aral Sea, salinization of large areas of land, and numerous other severe ecological consequences. Due to the strong impact of human economic activities, desertification occurs to varying degrees on more than 60% of Uzbekistan's territory. The rapid progression of desertification leads to numerous socio-economic and ecological consequences. It should be noted that desertification in

Uzbekistan has the potential for sustainable development; however, the process is intensifying and expanding.

In recent decades, one of the most dangerous ecological crises in the Aral Sea basin has been the increase in airborne dust and the occurrence of severe dust and salt storms. In arid regions, airborne dust consists not only of solid particles but also various salts, including sodium, calcium, pesticides, chemical substances, and highly toxic compounds, which are extremely hazardous to human health, plants, animals, and the environment as a whole. Research conducted in the lower reaches of the Zarafshan Valley indicates that 50% of the existing salt mass in the region originates from the Aral Sea. This factor is a primary cause of reduced pasture productivity and the degradation of biodiversity.

Research conducted in 1996 by "O'zdravloyiha" showed that 40% of the 18 million hectares of studied pasture lands had undergone degradation. This process is particularly severe in the Navoi and Bukhara regions, as well as in the Republic of Karakalpakstan. Overall, in subsequent years, pasture productivity across the Republic decreased on average from 23% to 25%. The development of geological exploration, construction of gas and water pipelines, railways and roads, extraction of minerals, high-voltage power lines, urbanization, industrialization, and other factors have contributed to intensified desertification across large areas of the country's landscapes.

Uzbekistan, located in an arid region, has approximately 80% of its territory consisting of deserts and semi-deserts. Currently, nearly 60% of the country is affected by desertification. This process causes significant damage to the country's ecological conditions, human health, and economy. Annually, the economic losses caused by desertification amount to several hundred million US dollars. Nevertheless, desertification has not yet been thoroughly studied.

Therefore, the achievements in combating desertification so far have been varied, and the results remain insufficient.

The main goal and objectives of the ongoing scientific research are to fundamentally study the nature and causes of desertification occurring in the conditions of our country, to identify the factors contributing to the desertification process, to classify its types, and to determine the patterns of its distribution, as well as to develop strategies to combat this process.

Desertification is studied primarily in clearly defined natural geographic complexes, using a systematic approach to geographic analysis. Consequently, measures to combat desertification must be implemented within naturally bounded areas. To solve this task, the method of interrelation analysis (i.e., the one-sided interrelated method) is applied. This involves analyzing various natural components and indicators that reflect the desertification process.

The distinctive feature of the proposed method is that it allows for analyzing natural and anthropogenic factors contributing to desertification across different landscapes (ecosystems) in an interconnected manner. The analysis and verification of desertification factors are carried out according to the "factor – process – result" sequence. Here, the factor represents natural and anthropogenic influences, the process reflects the manifestation of matter and energy, and the result is the various forms of desertification observed. As a result, it becomes possible to construct a cause-and-effect chain that reflects the emergence of desertification.

Studying desertification using this "chain reaction" method has recently been highlighted as an important task in ecology and geography. This approach allows for the consideration of all factors and objective causes, as well as the study of the dynamics of natural and anthropogenic mechanisms. Accordingly, a method has been developed to construct a cause-and-effect chain that reflects the occurrence of desertification. This method enables researchers to account for all factors and objective causes of desertification while understanding the dynamics of natural and anthropogenic mechanisms.

To implement this method, it is necessary to conduct landscape geographic fieldwork and describe the desertification process occurring in each specific landscape.

Measures to Prevent Desertification:

1. **Sustainable Agricultural Practices:** Implementing crop rotation, using organic fertilizers, and adopting modern irrigation technologies.
2. **Forest Restoration:** Planting new forests and protecting existing ones.
3. **Erosion Control Measures:** Establishing green belts and installing systems to prevent water erosion.
4. **Environmental Protection:** Preserving plant cover and conserving natural resources.

At the regional level, one of the most effective methods to combat desertification is large-scale forest reclamation (afforestation). In this regard, the mountain forest reclamation projects conducted in Oqtosh, Omonqoton, and other areas, as well as the saxaul forest plantations in the foothill regions of the Republic (including the Aral region, Qarnobchul, Mirzachol, and Nurota deserts), serve as excellent examples of combating desertification.

Currently, in the Central Asian region, human economic activities have already begun to significantly influence processes within large natural complexes, demonstrating the real impact on mountain and plain systems.

Conclusion

The relationship between humans and nature has historically been deeply interconnected. However, due to industrial development, rapid population growth, technological advancement, and the disruption of ecological balance, human impact on nature has increasingly taken on a negative character. One of the most dangerous consequences of this impact is desertification. Desertification is not merely a natural process; it is a global problem resulting from human activity and currently poses a serious threat in many regions of the world, including Uzbekistan.

A range of human-induced factors contributes to the process of desertification. Specifically, illegal logging, inefficient use of water resources, improper land reclamation, excessive use of chemicals in agriculture, and overgrazing of pastures lead to soil degradation and reduced fertility. Consequently, large areas of land become unsuitable for use, crop yields decline, and food security is directly threatened.

Moreover, desertification disrupts ecological systems, reduces biodiversity, depletes water sources, and contributes to air pollution. Climate-related factors such as drought, rising temperatures, and decreased precipitation further accelerate this process.

This situation demands increased ecological responsibility from humanity and a conscious, careful attitude toward the environment. Preventing desertification requires strengthening environmental legislation, restoring degraded lands, implementing sustainable agricultural practices, expanding water-saving technologies, and raising ecological awareness among the population. Additionally, large-scale environmental programs carried out through international cooperation are of significant importance.

References:

1.Алибеков Л.А. Инсон ва табиат. –Т.: Фан ва технология нашриёти. 2016.
2.Алибеков Л.А., Алибекова С.Л. Социально-экономические в последствия процесса опустынивания Центральной Азии. –М.: Вестник Российской Академии Наук. №5. 2007.
3. Алибеков Л.А. Природные механизмы опустынивания. –М.: Вестник Российской Академии Наук. №8. 2003.
4. Бабаев А.Г. и др. Пустыни. Природа Мира. –М.: Мысль, 1986. – 318 с.
5.Бабаев А.Г. Проблемы пустынь и опустынивания. –Ашхабад, 2012.
6. www.iupr.ru