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DESERTIFICATION AS AN ENVIRONMENTAL PROBLEM OF OUR TIME

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Abstract: This article examines desertification as an environmental problem in the modern world. Desertification is recognized as one of the most pressing global challenges, and land degradation is considered one of the most pressing environmental issues of our time, affecting the lives and well-being of billions of people worldwide. Furthermore, desertification is considered in the context of its negative impacts and consequences, such as droughts, which contribute to the deterioration of soil fertility and lead to reduced crop yields. It is also noted that all these negative factors collectively pose a threat to food security, which in turn leads to environmental and socioeconomic consequences, with a subsequent increase in the risk of hunger and malnutrition among large segments of the population.

Keywords: environmental issue, land degradation, natural resources, water bodies and vegetation, climate change, deforestation, soil sterilization, Gobi Desert, socioeconomic stability, population migration.

INTRODUCTION

Desertification is a global environmental problem that disrupts the global economy and reduces living standards. According to the UN, drylands already cover 30% of the planet, covering more than 100 countries and home to 2 billion people.

Desertification is the most significant threat to biodiversity on Earth. According to UNEP (the United Nations Environment Programme), a quarter of our land is at risk of desertification. Globally, more than 2 billion hectares are subject to desertification. This figure increases by 12 million hectares annually. The resulting decline in the productivity of arable land and pastures threatens the livelihoods of over 1 billion people in more than 100 countries.

Desertification is land degradation, in which a relatively arid region, under the influence of various factors, becomes increasingly arid, losing water bodies, vegetation, and wildlife. This problem is associated with a number of factors, including climate change and human activity. Desertification is a serious global environmental problem.

LITERARY RESEARCH

Areas prone to desertification are generally considered ecological disaster zones. Desertification is particularly devastating in arid regions with their fragile, easily destroyed ecosystems. The destruction of vegetation due to overgrazing, the clearing of trees and shrubs, the plowing of lands unsuitable for agriculture, and other economic activities that disrupt the delicate balance of nature

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greatly intensify the effects of wind and water erosion and the desiccation of the upper soil layers. The water balance is sharply disrupted, groundwater levels drop, and wells dry up. The soil structure is destroyed, and its saturation with mineral salts increases. The bioproductivity of ecosystems decreases.

In the context of environmental disasters, I would like to draw public attention to desertification in the modern world as one of the negative factors of our time. In recent years, global warming has been accelerating worldwide. It's no secret that climate change could lead to a decline in renewable water resources. Water shortages could negatively impact the provision of water supply and sanitation services and human health. Furthermore, water shortages could trigger desertification of vast territories, which in turn could lead to migration flows from arid regions.

Sources [1, 2] note that desertification first came to the attention of the global community as an environmental problem in the 1960s. Today, desertification is recognized as one of the most pressing global problems. Land degradation is one of the most pressing environmental issues of our time, affecting the lives and well-being of billions of people worldwide. According to UNESCO, approximately 3.2 billion people, or almost half the world's population, face the consequences of land degradation.

According to source [3], the main consequences of desertification include the following negative situations:

- reduction in the diversity of animal species and numbers;
- reduction in food production, decreased soil fertility and the land's natural resilience;
- increased flooding in lower river reaches, deterioration in water quality, sedimentation in rivers and lakes, siltation of reservoirs and shipping channels;
- deterioration of human health due to wind-blown dust, including eye, respiratory, and allergic diseases, and psychological stress;
- disruption of the normal way of life of the affected population, forced to migrate to other areas;
- poverty.

The ecological and economic consequences of desertification are significant and almost always negative. Agricultural productivity declines, and species diversity and animal abundance are reduced, leading to even greater dependence on natural resources, especially in poor countries. Desertification limits the availability of basic ecosystem services and threatens human security. It is a significant obstacle to development, leading the United Nations to establish the World Day to Combat Desertification and Drought in 1995, then to proclaim 2006 the International Year of Deserts and Desertification, and subsequently to designate the period from January 2010 to December 2020 as the UN Decade for Deserts and the Fight against Desertification.

Citing UN data, source [4] states that desertification could potentially affect over a billion people and approximately one-third of all land used for agricultural purposes. This applies particularly to large parts of North Africa, Central Asia, Southeast Asia, Australia, parts of North and South America, and Southern Europe. In 1994, the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD) was adopted in Paris. Its purpose is to unite the efforts of government and public organizations at the international, regional, national, and local levels to combat desertification, land degradation, and mitigate the effects of drought.

According to the website [5], desertification refers to a group of serious environmental problems that affect vast areas across all continents. Desertification occurs when an area loses water, becoming

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increasingly dry, which leads to the loss of existing conditions for the development of various plant species and animal life. And the threat to biodiversity is one of the most significant adverse consequences of desertification. Desertification destroys agricultural lands and the lives of millions of people worldwide. Although its drivers are a mixture of natural and human activity, the process is well understood and can be mitigated if there is the will of national leaders. As the name suggests, desertification is a process of land degradation in which a relatively dry area gradually turns into a desert. This is usually associated with the loss of any water bodies and vegetation that were once in place. Desertification can have many causes. This process is influenced by climate change (warming), as well as uncontrolled and reactive human activity. Inadequate agriculture and deforestation (cutting down trees) have the greatest impact on the intensity of desertification, which quickly leads to soil sterilization – turning it into a desert.

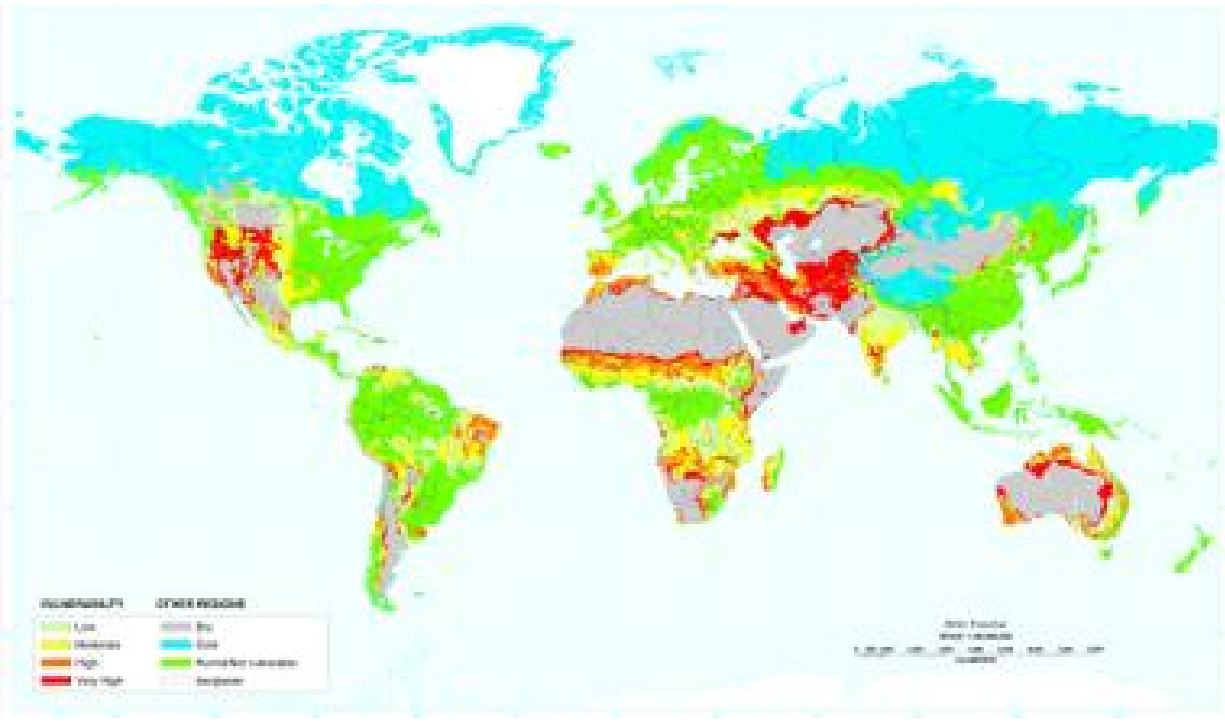


Figure 1. Illustration of areas of the Earth vulnerable to desertification.

As presented in the materials on website [7], regions of the Earth's surface are illustrated (Figure 1), indicating the areas most vulnerable to desertification. As can be seen from the figure, desertification occurs on all continents of the globe. The desertification map of the Earth is color-coded according to the degree of desertification risk: yellow indicates moderate desertification risk, orange indicates high risk, and red indicates very high risk.

Based on data from website [7], it can be concluded that another large area susceptible to desertification is the Gobi Desert. Currently, the Gobi Desert is the fastest-growing desert on Earth. According to some researchers, the Gobi Desert consumes over 3,370 square kilometers of land

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annually. This has already led to the destruction of many villages. Currently, photographs suggest that the Gobi Desert has expanded to such an extent that the entire nation of Croatia (approximately 4 million people) could fit within its territory. The encroaching desert is posing a serious problem for residents of China. Although the Gobi Desert itself is still quite far from Beijing, field surveys indicate that large sand dunes are forming just 70 km outside the city.

Methodology

Based on UNEP's definition, desertification is the degradation of land in arid, semi-arid, and dry sub-humid regions of the earth as a result of natural and, of course, anthropogenic factors. Their combined effects greatly exacerbate desertification processes. Land degradation can be classified as very severe, severe, moderate, or mild. Severe and very severe land degradation are commonly referred to as desertification.

Desertification is a global problem with serious implications for biodiversity, environmental security, poverty eradication, socioeconomic stability, and sustainable development. Desertification is not a new problem—it has played a significant role in human history, contributing to the fall of several empires and the displacement of local populations. However, today, the rate of degradation of arable land is estimated to be 30-35 times higher than historical rates. It's worth noting that desertification is a process by which a territory belonging to one natural zone becomes a desert. Many countries around the world face this problem, and more and more territories are experiencing desertification. According to UNESCO, one-third of the world's land surface is at risk of desertification, negatively impacting the livelihoods of millions of people who depend on the ecosystem services provided by these lands.

Desertification isn't just about deserts, and it doesn't just occur in Africa. Desertification is a process in which desert-like conditions develop as a result of degradation processes, largely due to a significant reduction in soil productivity. The most vulnerable areas include regions with arid, subarid, and dry climates, which are highly sensitive to human and animal activity, as well as climate change. Soils become eroded and salinized, they lose their ability to retain moisture, groundwater levels drop, and vegetation decreases or disappears entirely. Desertification renders land infertile.

According to UNESCO, by 2050, 90% of the earth's surface could face desertification, which will have a number of serious consequences. Land degradation affects various areas: ecosystems, climate, agriculture, and human life. Desertification can be considered as an environmental problem at the present stage, as it leads to environmental and socio-economic consequences10

How does an environmental problem lead to biodiversity loss? Desertification causes natural vegetation to disappear. This reduces the habitats of animals and plants. This, in turn, reduces biodiversity. As a result, ecosystems become vulnerable to external influences and are less resilient. Climate change. Soils store carbon thanks to plants and humus. When soils degrade, this carbon is destroyed, and it is released back into the atmosphere. This changes the composition of atmospheric gases. Also, when land becomes desertified, it reflects more sunlight, which increases air temperatures and accelerates climate change.

Among the social consequences, desertification creates food shortages. Agricultural land degradation leads to reduced crop yields and food shortages. This, in turn, leads to population migration. In areas where land degradation and desertification become serious problems, deteriorating living conditions and loss of agricultural income can lead to migration in search of better economic opportunities. This will also negatively impact public health. Desertification increases the frequency

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and intensity of dust storms, leading to an increase in cardiovascular and respiratory diseases, especially in arid, semi-arid and dry regions.

As a rule, declining land fertility has economic consequences. Desertification reduces the economic value of land, diminishes its ability to support agricultural production, and requires additional expenditures to restore soil and water balances. Regional poverty increases. Reduced land productivity reduces family incomes in rural areas. This can increase the proportion of people living in poverty and limit access to basic services such as healthcare and education.

Conclusions

Desertification contributes to the exacerbation of economic, social, and geo-ecological problems, such as poverty, declining public health, reduced agricultural productivity, food insecurity, a decline in the number and diversity of plant and animal species, water scarcity, decreased resilience to climate change, and forced migration.

In conclusion, we would like to note that desertification, however, does not exhaust the full depth of the economic problem that humanity faces today in an extremely diverse array of manifestations. These manifestations demonstrate that all of humanity faces an environmental challenge, regardless of the international division of labor, as this problem is becoming global in scope.

Thus, we can conclude that desertification represents a major economic, social, and environmental problem for many countries on all continents. It is worth noting that desertification processes have intensified in recent decades due to the sharp intensification of natural resource management and climate change on both a global and regional scale. Moreover, this is characteristic not only of a single country, but of all countries worldwide: these include African countries, countries in Southeast Asia, and elsewhere. This process is also observed in Europe, especially southern Europe.

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