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LAND RESOURCES IN CENTRAL ASIA AS A SOCIAL FACTOR

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Abstract
In this article, the authors focus on such an important issue as the fertility of the land and its impact on social reality. The issues of land degradation in Central Asia are considered.

Keywords: land resources, fertility, ecological crisis, desertification, natural resources, social problem.

Introduction

As you know, ever-increasing in the second half of the twentieth century. water and wind erosion of soils, deforestation, technogenic pollution of soils, fresh waters and the World Ocean, industrial emissions into the air - all this has begun to take on global dimensions. For the first time in the history of civilization, human production activity began to threaten the existing balance of natural processes on planet Earth. Soil degradation is a threat of ecological crisis. Understanding the danger of the global ecological crisis prompted the United Nations to convene in 1972 in Stockholm a special session devoted to the problems of environmental protection and regulation of the use of natural resources. The 10th Anniversary International Congress of Soil Scientists, held in Moscow in 1974, also considered for the first time the role and significance of the Earth's soil cover in the functioning of its biosphere. In 1977, the UN World Conference on Desertification and Soil Degradation was convened in Nairobi. Five years later, in 1982, the World Food Organization (FAO) adopted the "World Soil Charter", in which it called on the governments of all countries to consider the soil cover of the Earth and each country as a world heritage of mankind.

Concerned about the state of the environment, a number of international organizations held in the 80-90s. 20th century analysis of the state of natural resources, including soils and the land fund of the world. It turned out that the area of arable land on planet Earth is 3 billion 278 million hectares, or 22% of the total land area. Moreover, highly and medium productive soils (completely plowed and developed by the end of the century) make up only 9% of the earth's land area.

1. Ice sheets 1440 million hectares - 10% of the total land area;
2. Very cold lands 2235 million hectares -15% of the total land area;
3. Very dry land 2533 million hectares - 17% of the total land area;
4. Very steep slopes 2682 million hectares - 18% of the total land area;
5. Very thin soils 1341 million ha - 9% of the total land area;
6. Very wet soils 596 million hectares - 4% of the total land area;
7. Very poor soils 745 million hectares - 5% of the total land area.

Total unsuitable land 11,622 million ha - 78% of the total land area
Unproductive soils 1937 million hectares - 13% of the total land area
Moderately productive soils 894 6 million ha - 58% of total land area
Highly productive soils 447 million hectares - 3% of the total land area
Total arable land 3278 - 22% of total land area
The total land area of the Earth is 14900 million hectares - 100% of the total land area. The remaining lands are not suitable for agriculture due to different climatic, geological orographic conditions.

It should be added to these data that over the historical period, mankind has already lost about 2 billion hectares of once fertile soils, turning them into anthropogenic deserts and inconvenient lands. But this is more than the total area of world agriculture! The loss of fertile developed soils continues in our time. Every year, about 8 million hectares are withdrawn from agricultural use due to alienation for other economic needs, and about 7 million hectares - as a result of various degradation processes. To date, 75 percent of soils have been degraded. “Every year we lose millions of hectares of fertile land, which leads to the loss of about 10 percent of global GDP. Desertification and drought in one way or another affect 3.2 billion people.

Thus, every year humanity at the end of the twentieth century. lost about 15 million hectares of productive land. Meanwhile, it has been established that the process of soil degradation is proceeding at an increasing rate: in the second half of the last century, it increased 30 times compared to the historical average.

More than 90% of food products modern mankind receives as a result of the use of soil fertility in agriculture and animal husbandry. Meanwhile, as has already been shown, the area of fertile soils on Earth is decreasing, and the population of the Earth is increasing. According to the UN forecast, the world population by 2050 will increase by 3.3 billion people and will reach more than 9 billion.

Of course, special attention and protection of fertile lands is the most important condition for social stability. And these problems are not alien to the countries of Central Asia. Since the population of Central Asia in 2021 grew by 1.66% - by about 1

million 172 thousand people. Such a forecast based on UN data was presented by the Worldometer project.

According to the latest UN estimates, the current population of Central Asia is 75 million 426 thousand 628 people (5th place among the sub-regions of Asia) - this is about 1% of the total population of the Earth. The share of Uzbekistan in this is about 45%, Kazakhstan - 25%, Tajikistan - 13%, Kyrgyzstan and Turkmenistan - 8.5% each. The birth rate is also positive - about 3 children per 1 woman of reproductive age, which explains the continuing dynamics of population growth.

48% of residents live in cities, which changes the perception of Central Asia as a region with a predominantly rural population. The main emphasis in the economy is on industrialization and reorientation of exports from raw materials to products with high added value.

Central Asia remains one of the youngest regions, with an average age of 27.6.

Over the past 10 years, the population of Central Asia has increased annually by an average of one million people.

Accordingly, food security issues are directly related to the possibilities of natural production of fertile lands.

But first of all, you need to understand the issues of land classification. What makes the quality of land suitable and fertile?

According to the definition, soil is a special natural body that combines the properties of an inanimate object and a living structure. Its main quality was called fertility - the ability to support the growth and development of plants.

In order for soils to form, a combination of a number of conditions (factors) is necessary:

loose rocks;

sufficient hydration;

living organisms (plants, animals, fungi, a complex of microorganisms);

favorable relief;

climate, which determines the combination of heat and moisture.

But even having isolated all these components, it has not yet been possible to artificially create soil that has fertility comparable to natural samples. It turned out that for this the interaction of all components must occur for a very long time (at least thousands of years). It is clear that the ratio of the factors listed above is far from being the same everywhere on the planet, and this has become the main reason for the diversity of soils.

The study of soils in the 19th century led to the realization of one of the fundamental laws of the Earth - natural zonality. Indeed, the soil map surprisingly resembles a map of natural areas. The analysis of soil properties also made it possible to create a fertility map, which reflects the main quality of the soil. It turned out that the most fertile soils are formed in different conditions, this can be affected by a combination of various factors. For example, the humid and warm ecosystem of Southeast Asia or Florida has formed quite fertile soil, thanks to the constant supply of organic matter from evergreens and its rapid processing by fungi and microorganisms.

In Central Asia, out of a total land area of 154.9 million hectares, 59.1 million hectares are suitable for cultivation, of which only 10 million hectares are actually used. Half of the actual cultivated land is in oases (they naturally drain and have fertile soils). The other half of the lands require complex and expensive land reclamation measures to be used, including not only drainage and leveling, but also improving the soil structure. Land is unevenly distributed across countries: there is enough land in Kazakhstan and Turkmenistan, and there is a lack of land in the other three countries. Of the total land area of 154.9 million ha, about 32.6 million ha are considered suitable for irrigation, and only 7.9 million ha are irrigated (or only 5.1% of the total area of the Aral Sea Basin). Non-irrigated area (pastures, meadows, fallow lands) occupy about 54 million hectares. This includes 2 million hectares of rainfed arable land, but their productivity on average is no more than one tenth of the productivity of irrigated land. Currently, rainfed lands do not play a significant role in the gross agricultural production of the Aral Sea Basin, with the exception of an extensive livestock system (cattle and sheep). However, increasing the productivity of non-irrigated (rainfed) lands is an important task.

An important factor in soil formation is artificial irrigation. Long-term irrigation had a beneficial effect on the soils of the oases, but led to salinization and waterlogging of the surrounding lands. The destruction of natural vegetation in the deserts caused deflation of the soils of sandy massifs, the extermination of tree and shrub vegetation in the mountains and foothills led to increased erosion and the stagnation of forest soils.

The climatic conditions of soil formation on the plains of Central Asia and Central Kazakhstan change from north to south. In this regard, the steppe chernozem soil zone of the extreme north of Central Kazakhstan is replaced to the south by zones of chestnut soils, then brown desert-steppe soils.

The desert plains of Central Asia proper belong to the zones of gray-brown soils (northern and southern), where, in accordance with the diversity of parent rocks, various soils are distinguished, belonging to the types of gray-brown soils, takyr soils

and takyrs. In the south, in ephemeral deserts, semi-deserts of piedmont plains and foothills, typical gray soils are common.

Features of climatic and hydrogeological conditions make the soil especially prone to salinization. Some lands, especially in intermountain valleys, were initially saline due to the aridity of the climate. The process of salt accumulation is enhanced by the pressure of deep mineralized artesian waters.

And as you know, the most vulnerable areas include regions with arid, subarid and dry climatic conditions, which are very sensitive to human and animal activities, as well as to climate change. Soils become eroded and saline, they lose their ability to retain moisture, groundwater levels decrease, and vegetation cover decreases or disappears altogether. Desertification causes the land to become infertile. Desertification is a silent, invisible crisis that destabilizes the global community.

Desertification, land degradation and drought are global problems.

Desertification exacerbates economic, social and environmental problems such as poverty, ill health, food insecurity, biodiversity loss, water scarcity, reduced resilience to climate change and forced migration.

- Poverty is both a cause and a consequence of desertification. Up to 90% of people living in drylands are citizens of developing countries. A population living in poverty and suffering from desertification can become even poorer due to the lack of sustainable land. Moreover, desertification exacerbated by climate change could lead to famine in the least developed countries.
- According to the WHO, the potential impact of desertification is the risk of malnutrition due to the reduction of food and water supplies, clean water, the risk of respiratory diseases caused by atmospheric dust from wind erosion, the risk of the spread of infectious diseases during forced migration due to desertification.
- Desertification has a direct impact on food security: we cannot continue land degradation with the goal of increasing food production by 70% by 2050 to ensure global food security.
- Desertification has a negative impact on biodiversity through loss of species diversity, reduced functionality of ecosystems, invasion of new species, and changes in biomass production.
- Desertification, land degradation and drought have a negative impact on the availability, quantity and quality of water resources, leading to water shortages.
- The loss of productive land encourages people to make risky life decisions. In rural areas, where people depend on scarce productive land resources, land degradation is a driving force behind forced migration.

Adopted on June 17, 1994, the UN Convention to Combat Desertification is the only legally binding international agreement linking environment and development with sustainable land management. Central Asia is a classic example of an arid and subarid area characterized by serious transboundary desertification problems.

It is estimated that 4-10% of cultivated areas, 27-68% of pastures and 1-8% of forests are currently significantly degraded in Central Asia. The causes of land degradation are many, complex and vary from country to country, but are generally linked to the misuse and overexploitation of the natural resource base, in particular poor and unsustainable agricultural practices, overgrazing, deforestation, forest degradation and natural disasters.

As in the rest of the world, in the countries of Central Asia desertification, land degradation and drought are not only a serious environmental problem, but also an economic and social problem. According to the FAO report, the economies of Central Asia are still largely based on agriculture, which makes up 10-38% of GDP and provides 18-65% of employment, which makes the economies of these countries vulnerable to droughts by reducing agricultural production, negatively affects food prices, trade, access to markets and leads to lower farmers' incomes and unemployment. Desertification, land degradation and drought directly affect the livelihoods of the rural population, reducing the productivity of land resources and negatively impacting the stability and functioning of natural systems, as well as the services that depend on these systems.

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