

## NATURAL GEOGRAPHICAL CHANGES IN THE ARAL SEA AND THE ARAL SEA REGION AND THEIR CURRENT STATE

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**Abstract:** *The article discusses natural geographical changes in the Aral Sea and the Aral Sea region and climate change in the Aral Sea, changes in the hydrological regime of the Amudarya and Syrdarya, the formation of natural saline reserves in the Aral Sea and the Aral Sea region, deflation, soil erosion, migration of salt dust from the Aral Sea..*

**Key words:** *Aral and Aral Sea region, Amudarya and Syrdarya, Engineering, Ordaboy, Left and Right Akkay, meteorological station, sand and dust storm, wind, speed.*

### INTRODUCTION

It is known that the components of nature are constantly evolving in contact with each other. If one of the components is affected, it will cause the others to change and as a result various natural, socio-economic and environmental problems will arise. The problem of the Aral Sea and the Aral Sea Basin, which has arisen due to the impact and misuse of a single water component, and the changes in its nature, are now very urgent.

The natural conditions of the Aral Sea and the Aral Sea Basin are among the areas that are rapidly changing as a result of human activities. Beginning in 1961, the region began to experience negative changes in natural conditions due to the sharp decline and retreat of sea levels (Table 1).

Over the last 60 years, the process of desertification in the Aral Sea region has been developing.

7 million hectares of land. In addition, the landscapes of the Amu Darya and Syr Darya deltas are being severely affected. The main reasons for the degradation of the Aral Sea ecosystem are:

- Natural: aridity of the climate, the formation of natural salt deposits in the alluvial plains, the process of deflation, soil erosion, the migration of salt dust from the dried bottom of the Aral Sea, and others.

- Anthropogenic: soil contamination with agrochemical fertilizers, compaction of soils and reduction of humus content, livestock waste, contamination of agricultural lands with sewage and sewage, sewage and sewage pollution.

The aridity of the Aral Sea hydrometeorological regime is very noticeable. For this reason, a group of scientists (S.Yu. Geller, 1969; V.N. Kunin, 1959; V.L. Schultz, 1975) said

that the influence of the Aral Sea is limited to the narrow coastal strip, and its construction does not lead to significant changes in the natural environment. , other groups (SB Kabulov, 1974; BA Fedorovich, 1978; NN Khodjibaev, 1968) noted the influence of the large water basin on the hydrometeorological regime of the surrounding areas.

\*Changes in the natural environment of the Aral Sea and the Aral Sea Basin \*

Changed Elements (Components)	Rationale
The flow of rivers	Anthropogenic impact and recurrence of drought years
Desertification	Decreased river flow, arid climate, land misuse
Climate	Rising temperatures in summer and falling in winter, declining humidity, dust and air pollution
Quality of clean drinking water and groundwater	Dumping of sewage into rivers, overuse of pesticides in agriculture, mineralization of groundwater
Soil cover	Transformation of hydromorphic soils into semi-hydromorphic and automorphic soils, salt accumulation in all soils, expansion of salinity area
Diversity of species	Changes in flora and fauna have led to a decline in species and quantitative indicators.

\* The table is compiled by the author.

According to IP Gerasimov and others (1983), the reduction of the Aral Sea area has led to an increase in the continental climate of the Aral Sea. The decrease in sea level led to an increase in temperature of 2.5-30 C in July and a decrease of 1-20 C in January. Over the last 15-20 years, the relative humidity of the summer air has decreased by an average of 7-10%. The average annual precipitation decreased by 22 mm (15%).

The decline in the Aral Sea level has affected the local climate of the coastal zone at a width of 50-100 km. Summer temperatures have risen, and in the spring and summer there is a decrease in humidity in the area 30 km from the coast. Climate change in the South Aral Sea region is local. The microclimate has changed for several tens of kilometers from the previous shores. In particular, it is strong in the area of 40-60 km from the previous shoreline. Mainly during the hot seasons of the year, the amplitude of daytime temperatures and the decrease in relative humidity are observed on the shores, and in April-July, dust storms are more frequent. In the arid areas of the sea, changes in the local climate have led to an increase in the number of very hot days by 15%, and a decrease in the number of days with high humidity by 4 times. In general, the weather conditions, which are unfavorable for human activities, have increased (Eco.oc.local).

Compared to the surrounding deserts, the Aral Sea has less precipitation (100 mm). Nevertheless, it has greatly benefited the desert pastures, which are the basis of Aral cattle

breeding. This is due to the fact that a large amount of water evaporates from the sea, which is distributed in the surrounding areas, and the humidity rises rapidly, creating conditions for the growth of plants. This mitigating effect of the sea is 50-80 km, and 200-300 km in the south.

Climate change in the Aral Sea region is influenced by natural, global anthropogenic and local anthropogenic factors. Today, humanity is more concerned about changes in the climate under the influence of anthropogenic factors than about changes under the influence of natural factors. Local anthropogenic change in the Aral Sea region is an event that occurred during the degradation of the Aral Sea. Local anthropogenic change in the Aral Sea region is an event that occurred during the degradation of the Aral Sea.

In the Aral Sea region, the north-easterly winds blow for most of the year. Their maximum speed is 15-20 m / s. The average is 4.5 m / s and more. This speed is capable of scattering sand and salt dust over long distances. For this reason, the wind blows salts from the dried bottom of the sea, even if the wind speed is moderate. The volume of such salt dust migration within the territory is increasing several times a year. In particular, by the year 2000 the atmosphere will be 15-75 million tons per year. tons of sand and salts, but now this figure exceeds 80-100 million tons. These salt and sand dusts are spreading over a distance of 500 km. The marine reserves of such salts are estimated at 10 billion tons. more than a ton. The reduction in water volume and surface area has led to climate change in the Aral Sea region. As a result, the temperature increased by 1.5-2.50 C in summer and decreased by the same amount in winter, and the vegetation period was reduced by 10-15 days.

Changes in the natural conditions of the Aral Sea and the Aral Sea Basin are associated with a decrease in the flow of the Amu Darya and Syr Darya rivers, a gradual reduction of spring floods in the deltas and a decrease in sea levels. As a result, many lakes, streams, and swamps have become dry due to water scarcity and evaporation. In particular, after the commissioning of the Tahiatash hydroelectric power station in the Amu Darya River in 1974, floods decreased and the flow of river water was stopped. Until the 1960s, the Amu Darya River was divided into four branches (Engineering, Urdaboy, Chap and Ong Akkai). By now, such natural river networks have dried up.

Changes in the hydrological regime of the Amu Darya and Syr Darya have completely stopped in their lower reaches, the increase in the general salinity of water and changes in hydrochemical conditions have begun to have a strong impact on the structure of natural complexes. As a result, a general desertification process is taking place, leading to the formation of salt marshes and bald patches, and a sharp decline in the area of many reed groves.

As a result of changes in surface water, the regime of groundwater has also changed radically. This is because the main source of groundwater saturation was seawater, and many long-distance streams were formed, partly by atmospheric precipitation. In the past, the groundwater level was 1-1.5 m, but now it is 4-5 m, and in some areas it is 9-10 m.

Changes in the regime of groundwater have led to changes in their salinity. As a result, groundwater, which is dominated by low and medium mineralization, is now strongly and very strongly mineralized. The salinity of these waters is 3-5 g / l, in some places 5-10 g / l. Evaporation plays a key role in their mineralization.

Acceleration of desertification in the Aral Sea and the Aral Sea Basin has affected the formation of soil types and the process of soil formation in the region. These lands were mainly grasslands, swamps-meadows, alluvial-poor, meadow-bare, typical loam and other soils. Soils are also changing due to the lowering and salinization of groundwater levels and the absence of river floods. All soils, which had previously developed under hydromorphic conditions, are now developing in a semi-hydromorphic and automorphic manner. This is due to the poor reclamation situation in the South Aral Sea region and, on this basis, the formation of an unfavorable salt balance in the region. In the past, the Aral Sea was the main source of salt, but now it is mainly the Amu Darya and Syr Darya deltas. The area of hydromorphic soils in the Amu Darya delta was 630,000 hectares in the 1950s, but now it is 200,000 hectares due to the construction of the sea.

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