

# Research of Processes of Accumulation of Salts in Soils of Southern Aral Sea Area

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**Abstract:** *In the article the results of researches of processes of accumulation of salts are examined in soils of Southern Aral sea area. It is shown that засоление of soils is a general and making progress process. Formation of in salt soils is related to the accumulation of salts in subsoil waters and terms assisting their accumulation in soils.*

**Keywords:** Southern Aral Sea area, desertization, aridization, subsoil waters, solinization

## 1. Introduction

Presently research of terms of desertization and aridization of region of Southern Aral sea area and their influences on the drought-resisting types of plants a long ago attracts scientific environmentalists, physiologists, soil scientists, and biochemists of plants. Fight against a desertization, maintenance and increase of the productivity of plants despite their action - is one of by a priority task in area of ecology [1, 5].

A region of Southern Aral Sea area is the area of accumulation of salts during the protracted period. An Aral Sea ecological tragedy was outpoured in the whole series of negative consequences - from degradation of animal kingdom to the aridization of climate. Among the negative phenomena there is a considerable change of the wind mode in Southern Aral Sea area, that can accompanied by the bearing-out of enormous amount of sand and salt from the dried bottom of the Aral Sea. A problem is aggravated by the further shallowing of Aral Sea and continuous formation of new hearths of bearing-out of aerosols.

Territory of Southern Aral Sea area has, in most, in naturally-salt and, potentially dangerous for development of resalinization of soil. Southern Aral Sea area is an area thess of accumulation during thousands of years. The active processes of orogeny, on contiguous with her territory, are accompanied by the permanent bearing-out of soil-formation of material of containing salts, accumulations of him on plains.

## 2. Results and Discussion

In Southern Priaralya salting of soils (mainly sulfate and chloride) is a general and making progress process. So, in 1975 it was in salt 43% of irrigable earth, in 1985 - 80%, in 1997 - 94%. Takyr and saline land soils from 1960 increased on 91 thousand, saline lands and sands ha - on 43 thousand ha. Soils of delta Amudarya accumulate the more than 1 million tons of salts annually [2, 4, 5].

An enormous role the redistribution of salts is played by superficial and ground waters. Intensity of processes of redistribution of salts and accumulation of them in soils is determined by climatic terms - amount of atmospheric

fallouts and in size fumes, and also by lauter properties of soils, formation of soil breeds and by solubility of salts (table.1).

**Table 1:** Dynamics of subsoil waters depending on time of drainage of bottom of the Aral Sea area (Kabulov, 1999)

A date of selection of test	Sum of salts g/l	water-table (sm)
Sandy soils (western)		
05.06.77	21,810	45
19.10.79	16,795	80
17.10.83	13,103	195
Clay soils (Adjibay)		
07.05.77	21,212	40
31.08.79	15,336	70
19.09.83	10,060	285

In districts with a droughty climate in near desert and desert, where evaporation exceeds fallouts far, terms are created for the accumulation of salts in subsoil waters and formation of soil breeds. In mainly salt soils are located in these areas. The accumulation of salts in soils makes essence of salt-marsh process showing up at the near bedding of the subsoil mineralized waters in the conditions of mainly droughty climate of the water mode. At evaporation of water overhead horizons of soils are enriched by water soluble salts. The seasonal inflow of easily soluble salts due to evaporation of the mineralized subsoil waters can arrive at a 500-1000 ton on 1 ha [1, 2]. High maintenance of salts in saline lands determines the features of structure of their profile and property. The profile of saline lands in most cases is poorly differentiated on genetic horizons. In him distinguish humus horizon transitional and formation of soil breed. On all profile of saline land efflorescences of salts are noticeable, especially after getting of wall of cut dry.

In the initial stage of baring of sea-bottom, as a rule, hydromorphic and half hydromorphic saline lands develop. A leading factor in this process is a closeness of сильноминерализованных of subsoil waters. For an off-shore stripe the depths of subsoil waters are characteristic to 0,5 meters. At the decline of this level caused by departure of coastline, there is drying out of soils with formation of cracking superficial layer. Maximal maintenance of salts on postaquatorium drier (to 27%) is on a crust horizons. On the

whole for periphery of the Aral Sea the sulfate chloride-sodiums-characteristic, calcium and magnesium-sodium types of засоления [3, 4].

Hydromorphic soil of postaquatorium dry spell are the transitional stage to automorphic development of soil layer or meet only in the zones of the permanent moistening. The source of subsoil waters is подток from the side of seashore reservoirs. Unlike automorphic saline lands they are reserved not cleanly by a salt crust, and difficult on composition mixture of gypsum, clay minerals and water soluble salts. Such composition is extraordinarily unsteady to water erosion, and fallouts even insignificant result in her destruction; then a hydrochloric-gypseous crust can be restored with the subsequent spalling in summer months.

Taken away by wind from the dried bottom of the Aral Sea to irrigable earth a salt aerosol assists the solinization of different ways. Taking into account the steady height of area of the dried bottom [3, 5, 6] and, especially, the sharp increase of correlation of area of saline lands and area of postaquatorium dry spell can be talked about making progress development of examined this process, that promotes actuality of his research. On postaquatorium saline lands appear dry land of the Aral Sea area at intensive evaporation of water-wet enough soil on the areas exhibited to a sun, i.e. positive forms of relief. Thus the accumulation of salts in overhead horizons of soil takes place as a result of the capillary raising of salts to the surface.

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