

The Essence of Interaction of Oasis and Desert Geo-Systems

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Abstract - Scientifically studying and correctly analyzing the relationship between the oasis and desert at a time are essential, when the current ecological situation is tense, it will also help to forecast the future of the country, as well as its conservation.

Keywords - Oasis, Desert Geo-Systems, Ecological Situation, Geosystems.

The oasis and desert by thermogydrodynamic and hydraulic sides are developing geological structures in the interaction. The interconnectedness between the oasis and desert geosystems is primarily related to their lithologic-geomorphological conditions. They are especially natural territorial complex in the alluvial delta, on the proluvial-alluvial terraces of the rivers, in the proluvial plume and cone spaces. The use of a known part of geosystems or a partial in the farming leads to the continuation of the relationship between them on the basis of certain laws.

Mutual exchange with heat, moisture, various salts and other substances between geosystems, first of all, can be accomplished by surface water, ground water, and wind. In this connection, it is necessary to accurately define the effect of desert to the oasis nature and the effect of the oasis to the desert.

The influence of the oasis geo-systems to the desert nature. Agriculture in the oasis and irrigation canals has a direct impact on the level of groundwater and mineralization levels in the desert around oasis. The moisture content in those areas will increase. The influence area of the oases in the level of big and small is associated with the lithologic-geomorphological structure of the location.

Bearing movement of underground water will reach a considerable distance on proluvial plains with relatively good water permeability of the grunt. In the early 60-s of the 20 th century, about 15,000 hectares of land near the southern region of Mirzachul (in Tajikistan territory) began to erode, and the reclamation of old and newly acquired land in the desert began to deteriorate. This is due to the fact that the waters flowing from irrigated areas at the top of the proluvial soils flow into its edges. As a result, the surface water level rises and the level of salinity has increased several times.

The area of influence of the oasis in the flat delta and terraces can not reach much longer than the weight of mechanical parts of the beddings (about 30 km). Because in these regions the vertical motion of the water is higher than that of the liable.

Researches carried out in the suburbs of the Lower Amudarya and Zarafshan oasis show that, due to the flow of outflow from them, it was appeared some specific natural and anthropogenic regions. Subacval (lake) and superacval (lake- swampy) geosystems are developed in the zone I as a result of freeze water accumulation (0-1, sometimes 2-3m), which is very close to the ground surface. (for example, in

the vicinity of the Bukhara oasis in the valleys between the oasis and the Amu-Bukhara canal, etc.).

Moving away from the oasis, the water level decreases and the effect is reduced. This II zone is characterized by semi-hydromorphic saline complexes. In the third zone the surface water level is much deeper (3-5 and 5-7m), with semi-hydromorphic and it is exchanged with eluvial complexes.

In the arid regions, oases are a major factor in the formation of anthropogenic lakes. According to the data of the State Committee for Nature Protection of the Republic of Uzbekistan, the amount of pollutants (sinking and dropping) in Uzbekistan is 23-25 billion m³ (2013), of which 8-10 billion m³ is mainly discharged to the lowlands (saline lakes). Reports of the regional hydrological and melioration expedition only in Bukhara and Karakul oasis indicate that in 2012, 4.0 million cubic meters of water had been drained for irrigation, and 1.8 million cubic meters of water were dumped out of the oasis by drainage. The oasis water contained nearly 4,000 tonnes of various salts, with freeze water about 6707 tonnes of saline salts were removed.

In the Amudarya and Syrdarya rivers, the level of salinity of rivers increases (from 0.5 to 2 g per liter of water up to 3.0 grams in winter) by sinking and dropping waters (15 billion m³ in 2013). As a result, the level of underground water salinity increases (2.2-16.0 g per liter), soils are saline, and the continuous growth of tugai plants is deteriorating.

Influence of deserts to the nature of the oasis. Regular human-controlled settlements are always affected by desertification. After finishing of the irrigation in the oasis, the levels of water fall slowly. Finally, before the winter saline washing it drops to the lowest point. After that, from desert the high salinity (more than 10.0 g per liter of water) underground waters begin to reach the oasis.

Storm winds often bring various dust, salt, and sand particles to the oasis. A few days in the summer, the south wind blows, and the Afghan winds bring plenty of dust and sand particles to the southern oasis of Uzbekistan. In some areas, sand is covered in irrigated lands. In 1992, more than 200 hectares of irrigated land in the Khorezm oasis were not used in agriculture due to sandstorms.

The decrease of the Aral Sea water level and the salting from the water outlets in the Aral Sea area will result in 800-

1000 kg of land per hectare and 100-700 kg of salt in the Nukus city. This in turn causes deterioration of reclamation conditions of irrigated land, significant reduction of crop yields from agricultural crops were observed. According to the data of the State Committee for Nature Protection of the Republic of Uzbekistan, this figure is 5-15% in cotton, and in the rice - 3-10%. In general, the relationship between the oasis and the desert is more complex, multi-faceted, and the size of the oases depends on other forms, and requires a number of natural-anthropogenic processes and phenomena. Scientific research on this linkage and the application of appropriate measures will enhance the productivity of both geo-systems and will ultimately optimize their ecological conditions (Khodjimotov, 1994, - P. 110-112).

The seasonal dynamics of the landscape in the desert zone are primarily accompanied by the rise of ground water levels. In the summer, the highest level of ground water is stored during the growing season - from April to August and sometimes to September (groundwater in the Amudarya River, Sarikamish delta - rising waters up to 0.94 m). First, there is plenty of saline soils, at the end of summer. In the autumn, when the irrigation of agricultural crops stops, groundwater levels go down. The lowest level is observed from October to December. The rise and fall in the Bukhara and Karakul valleys is 1.30 and 1.80 meters, and the rise and fall rates are 0.014 and 0.01 m / day, average 2.49 meters (Mavlonov, Ganiev, 1983, - P. 88-89).

In the spring, the levels of ground water are rising again due to atmospheric precipitation, and in May it declines again. Generally, the salt goes down to the bottom layer due to rain and salt washing. Thus, a reverse process is observed. Groundwater order is a bit different at the height of the delta of the lower Amudarya. The amplitude of the ground water fluxes in these lands is not large - only 27 cm, even in the total irrigation season, the level of ground water reaches 2.39-2.54 m, which is explained by the fact that these waters are dispersed to the ground and satisfactorily flows to the interblock.

In conclusion, we can conclude that the dynamics of geo-systems are clearly visible in the conditions of the oasis and are intensive. Soil salt regime, agrochemical deposits, lightening of matter and other factors are participated in landscape dynamics. Depending on the hydrological processes in the oasis, the soil salt is in a positive and negative equilibrium, that salinization or salt accumulation occurs, but this is directly related to the degree of drainage

and drainage levels of humans. In general, landscape changes in one or another direction (salinity and salt formation) are the dynamics of geo-systems.

We believe that in the delta geo-systems, their future development will result in the accumulation of new elements. These include: a) accumulation of salt in the substrate of the continuous grunt (accumulation); b) collecting of irrigation water and old walls (fertilizers) as fertilizer and accumulation of various deposits in the soil due to other processes. This will change the mechanical composition of the soils. All of this gradually complicates the development of agro landscapes. As A.G.Isachenko (1991) pointed out, there is a radical transformation of the landscape in the future on the basis of a dynamic change trend (p. 223).

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