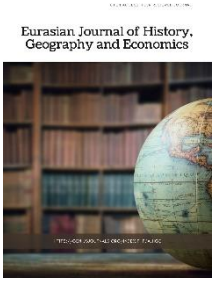

Forecasting – Informative Properties Of Natural Complexes Delta Exit Geosystems

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ABSTRACT

This article highlights the issues of predictive and informative properties of natural complexes of desert landscapes on the example of the deltaic geosystems of Uzbekistan.

Keywords: Natural Complex, Subaerial Deltas, Geosystems, Coastal Deltas, Near-Channel Bars, Interchannel Depressions, Zoning, Lake Basins.

Predictive and informative properties of natural complexes are determined based on an analysis of the properties of the natural components that make up their structure. In this work, the identification of these properties of desert landscapes is substantiated by the example of subaerial deltaic geosystems of Uzbekistan, as the dominant physical-geographical complexes, which have been sufficiently studied in terms of landscape genesis and structural-dynamic state. A conjugate (interconnected) analysis of the landscape of the forming components of dry deltas allows us to consider them as a single integral geosystem in which lithogenic, biogenic, hydrogenous and other components are closely interconnected and interdependent. Deltas, as integral physical-geographical complexes, are typical objects of landscape research, in which the general structure is determined. internal composition (texture), trend of change and nature of exploitation of natural resources and other features. A comprehensive analysis of delta geosystems is necessary to solve other scientific and applied issues regarding the use of natural resources.

Due to internal differences, deltas are differentiated into a number of naturally isolated complexes that differ from each other in the properties of the landscape-forming components. The main criterion for the ownership of geosystems here is the delimitation of territory with the same lithologic-geomorphological structure, which is the leading indicator of the division of the geosystem into smaller physical-geographical units. In delta conditions, changes in other components in space depend on lithogenic ones. Therefore, the more accurately the natural boundary of geological and geomorphological structures is determined, the greater the quality of the identified contours.

Based on the analysis of the lithological and geomorphological structure of the piedmont deltas, three parts or three geosystems can be distinguished, which differ sharply from each other. This is the top part - a sloping plain, composed of coarse clastic deposits, overlain by thin fine earth, then there is a middle strip - a gently sloping plain, composed of sandy-loamy-clayey strata with individual tongues, thin layers of pebbles wedged into it, the last is a flat plain consisting of clayey loamy-sandy deposits with interlayers of sand lenses. These three parts of the foothill deltas correspond to three areas or zones of the hydrogeological process: the absorption zone (the area of groundwater recharge), the discharge zone (the pinching area), and the dispersion zone (the subsidence area).

The soil cover also gradually changes from the apical part of the delta to the periphery inclusively; in the head part, eluvial soils are common (zone of development of water erosion), in the middle - hydromorphic (zone of development of saz, arc and other soils), in the peripheral part semi-hydromorphic or hydromorphic (zone of development of saline soils). soils). Due to the development of all the foothill deltas, their natural vegetation has not been preserved, so it is difficult to identify the pattern of changes in ecosystems in their individual parts.

Thus, all three parts of deltas, sharply different from each other, form spatially consistent geosystems with all individual landscape features. However, these geosystems are so interconnected that they cannot be separated from each other. The apical part of the delta, as an area of erosion, absorption of water masses, accumulation of the coarsest or largest substances transported from the entire basin, serves as their accumulator and director of migration of liquid and solid substances throughout the delta geosystem.

The middle part of the delta, as a storage area for liquid substances, serves as their evaporator and accumulator of easily and sparingly soluble salts in the aeration zone; part of the underground flow of subpressure waters wedges out to the surface in the form of springs (saz zone).

The peripheral part of the delta is an area where groundwater flow dissipates and is spent on evapotranspiration, filtration and accumulation of salts in the root layer of soil; sedimentation is also observed here along stream beds.

Based on the patterns and location of geosystems in foothill deltas, it is possible to identify their specific zonality, confined to naturally isolated parts. The top part is characterized by sloping loamy-pebble intensively drained plains with desalinizing irrigated light and typical gray soils: the middle part is characterized by gently sloping pebble-loamy-clayey very weakly (intensively artificially) drained plains with saline meadow, meadow-saz soils in combination with variously saline irrigated meadow soils ; peripheral - flat loamy-sandy-clayey undrained (intensively artificially drained) plains with variously saline irrigated meadow soils.

This zonation of geosystems is typical for those deltas that have a perfect structure. Those deltas in which the peripheral part is cut off by the river valley (deltas of Sangardak, Tupolanga, Kasansay, Namangansay, etc.), geosystems have a slightly different character, groundwater in them is deeply submerged and soil salinization processes are absent [1].

Deltas located in the flat part of Central Asia have similar properties, but, as mentioned above, due to the wide distribution of fine-earth sediments of great thickness, often underlain by clayey, sandstone and conglomerate to Quaternary sediments, as well as a slight slope of the relief surface, area the zones identified above vary significantly. The most widespread geosystems occupy the middle peripheral parts of deltas, while the apical part of most deltas is typical only for a small area, which is due to the nature of the accumulation of coarse sediments during the period of their supergenesis and the remoteness from mountain ranges at a considerable distance.

In lowland deltas, due to the presence of thick fine-earth deposits and the paucity of groundwater, wedging out of ground moisture is not observed; they only approach the surface up to 5-10 m, sometimes even less. Therefore, soils in most cases under natural conditions are

eluvial in nature. These include the subaerial deltas of the Obruchevskaya steppe, the North Afghan rivers, the Ancient Zerafshan, Kashkadarya deltas, etc. Under irrigation conditions, all dry deltas of a flat nature acquired the properties of hydromorphism with mineralized groundwater.

In coastal deltas, the zoning of geosystems, in contrast to foothill deltas, is directed mainly from the channel to the periphery. This is due to the location of the main river channels or channels with powerful riverbed levees in topographically commanding areas of the territory, formed as a result of regular accumulation of sediment in the channel [3, 4]. The channel of the Amu Darya from Nukus to the seashore is located in a fault zone where the earth's crust is uplifted. In coastal deltas, as in foothill and lowland deltas, the branching of the channel into numerous branches or channels begins from their apical part, therefore, the migration of liquid substances by underground flows also occurs from the head part in the direction and area of discharge.

Interchannel depressions - accumulators and evaporators of underground and surface runoff, are storage facilities for solid runoff and salts. Behind the strip of powerful riverside levees and interchannel depressions there are usually either scattered sands or lakes in combination with debris. In the Aral delta, the extreme peripheral strips are occupied by lakes and litters (Lake Sudochie, Karaumbet litter, etc.), which serve as areas or centers of discharge of the underground flow of the delta, moreover, their level lies significantly lower (about 10-12 m) compared to surrounding plain.

Based on the identified main physical and geographical features, it is possible to determine the zonation of geosystems of coastal deltas. The main artery of the coastal delta is confined to their middle zone, bordered by powerful river-bed levees, in which, due to the dominance of channel deposits and the ruggedness of the topography (0-8 m or more), the groundwater is slightly saline, predominantly of hydrocarbonate-calcium and hydrocarbonate-sulfate composition. In this regard, due to the presence of ensured underground outflow, the soils do not contain large amounts of salts. The riverbed levees are characterized by: dissected sandy loam-sandy elevated areas of alluvial-deltaic plains along the main branches of rivers with tugai forests on meadow-takyr tugai and alluvial meadow soils.

Interchannel depressions, distinguished due to the drainage of the territory by the presence of lake and swamp complexes overgrown with reeds and reed grass. the following are typical: interchannel loamy-clayey depressions with reed and reed thickets on alluvial swamp, meadow-swamp soils; interchannel depressions with typical swamps and lakes, in places overgrown with reeds.

Lake basins, often confined to the periphery of coastal deltas, are characterized by the following complexes: drainless basins with lakes, bordered by a swampy strip overgrown with cattail reeds; drainless loamy-clayey depressions with litter, devoid of vegetation.

Thus, the following geosystems, starting from the main channel, are characteristic of coastal deltas: riverside levees, interchannel depressions and lacustrine (sort) drainage basins; These geosystems mainly correspond to the facies zones identified by V.I. Popov et al. [2] in the Amu Darya delta.

Identification of the zonality of geosystems in deltas is facilitated by the differential use of reclamation on irrigated lands, increasing the efficiency of agrotechnical, agroreclamation, hydraulic engineering and organizational and economic measures.

A comprehensive analysis of the structural and dynamic state of subaerial deltaic landscapes showed that they contain a significant amount of predictive information that should be used when predicting their changes in connection with the increasing scale of use of natural potentials. In this case, it is necessary to pay attention to the differentiated natural complexes of subaerial deltas of various types, which often have regional characteristics.

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