

# **ANTHROPOGENOUS TRANSFORMATION OF LANDSCAPE COMPLEXES OF SOUTH-WEST ALTAI**

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The geography of natural territorial complexes of South-West Altai subjects to the rules of latitudinal zonality, vertical zonation and provincialism. Natural complexes of the investigated area refer to three physiographic mountain landscape class countries. Meanwhile, there were allotted seven altitude-zonal geosystems, 19 geocomplexes, 37 landscape views. The modern appearance of these altitude-zonal geosystems and region's geocomplexes is far from its natural state. Different manifestations of human activity in the landscape have been known for a long time. At the present time more intensive technogenic changes of natural landscapes and saturation them with the results of mankind labour take place.

Many landscape complexes of South-West Altai were historically transformed under the influence of a rich spectrum of human interventions, the geography of which is determined by the structure of the economy of the region.

First of all, landscapes of ore - mining areas underwent the transformation and they are continuing to undergo, as the territory of South-West Altai is historically one of the ancient ore provinces. Exploitation of a deposit is usually accompanied by the following processes - accumulation of waste rock, destruction of minerals, displacement of rock mass, changes of groundwater levels, their mineralization, rockfall, landslides, dusting, degradation of soil covering, destruction of biogeocenosis. In addition to the objects of mining industries, large areas of South-West Altai are occupied with metallurgical plants, manufacturing industry plants, agricultural lands, traffic arteries and urbanized regions. They differ in natural diversity, regional characteristics and they are sources of anthropogenic impacts on the landscape.

With the help of cartographic and system analysis, we identified 21 kinds, 10 types and 4 classes of anthropogenic influences. All of them are systematized and have cartographic expression in a series of intermediate maps at a scale of 1:1000 000, which are made according to the criteria of the system analysis of the content, identity, comparability, actuality and objectivity.

The received materials allowed to establish different nature of human interventions and simultaneous presence of several classes within concrete landscape complexes. The following geosystems of the region were most exposed to anthropogenic transformation: piedmont-low mountain steppe forest-steppe, mid-mountain steppe meadowy and piedmont-intermontane steppe semi-desert. The degree of their anthropogenic transformation is taken from 95 to 50%.

South-West Altai - the region has strong forest geosystems within the whole territory of the Republic of Kazakhstan. The research showed that natural stands is often broken with logging and fires (the most catastrophic fire which affected the forests of East Kazakhstan, were in 1972, 1987, 2008). Fires and logging, especially on the border of forest and forest-steppe complexes, contributed to the formation of large grassy clearings with meadow and steppe communities, and to forests conversion in so-called savannahs or park forests. As a result, these actions affected the position of the lower boundary of the forest: there was a rising of the absolute position of lower boundary of forest ranges. Human influence led to natural imbalance, directivity and rate of a number of natural processes were changed. For example, logging on scarp slopes of middle Rudny and South Altai and its transportation led to strong slope erosion, reinforced snow avalanches, changed the appearance of forest geosystems.

Some types of landscapes have a strong degree of disturbance. Lowland forest complexes can generally be categorized as highly and slightly disturbed and middle mountainous forest - as slightly disturbed.

Radical changes of landscapes related to the mining industry, particularly to the opencut mining. There are new types of transformed systems - mines, mine dumps, man-made basins for the storage of liquid and solid phases of ore processing: tailing

pits and others, storage of waste in liquid and solid state. They have their own structure, dynamics and functioning and fall in the category of highly disturbed.

The gradual transformation of the environment of South-West Altai primarily related to the exploitation of the internal parts of the earth using open and underground mining methods, to the operation of enterprises of mining, metallurgical and manufacturing industries, which have low-powered sewage disposal plants, to the creation of reservoirs, development of transport networks, the expansion of plowing lands, intensive forest management, including mountain forests, to the accumulation and disposal of industrial and domestic waste.