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ASSESSMENT OF THE SUSTAINABILITY OF LANDSCAPES OF THE NORTH-KAZAKHSTAN REGION TO AGRICULTURAL IMPACT

Abstract. The article deals with the research of sustainability of landscapes of North Kazakhstan region under conditions of long-term agrogenic load. In this connection and basing on the developed system of indicators there was carried out the assessment of geosystems' conditions and levels of their sustainability to the influence of human agricultural activities. The assessment was made according to thirteen indicators characterizing forming factors, landscapes functional conditions and properties of their main components. Assessment methods were based on the use of different specified rates that were transferred to a relative value (points) and were ranked according to variability (sustainability) of each landscape under direct or indirect agricultural exposure. Besides, this work performs spatial analysis and typology of the regional landscapes according to the index of potential resistance to agricultural influence. It was defined that the most resistant to agricultural human activities landscapes of Northern and central parts of the region are located within forest-steppe natural zone. Low potential resistance is typical of the landscapes located in the South-East of the region within dry steppe subzone and in the landscapes of the river Yesil valley. The level of steppe zone landscapes resistance to agricultural impact is defined as relatively stable. This work provides recommendations on restoration of ecological balance and establishing of stable functioning of the landscapes.

Keywords: landscape, geosystem, sustainability, agriculture, assessment, impact.

Introduction. North Kazakhstan oblast (NKO) is one of the leading agricultural regions of Kazakhstan. The agro-industrial sector covers more than 40% of the regional gross product. Almost a quarter of the republican acreage belongs to NKO. Annually it produces 25-28% of national gross harvest of high-quality grain. The structure of the region land resources refers up to 71%, or 6988.0 thousand hectares to agricultural lands, including 4320.4 thousand hectares of arable land (data of 2017). The rate of tilled soil in the region is 50%, reaching 70% in some administrative districts [1-3].

Long-standing agricultural load on the landscapes of the region had a negative impact on their conditions. There are dehumidification and reduction of soil fertility, increase of areas with wind and water erosion, degradation of agricultural land and reduction of its environmental sustainability [4, 5].

One of the reasons for the current environmental situation is unsustainable functioning of landscapes as a result of an imbalance between their natural potential and the nature of agricultural production. Not taking into account the properties and peculiarities of geosystems, on the one hand, and permissible agricultural load on the components, on the other, may lead to its further deterioration that can adversely affect economic development and food security of the region. Under the conditions of intensive agricultural development, one of the important tasks is maintaining sustainability of geosystems on the basis of complex examination of their state and properties and peculiarities of landscape structure of the region. In this regard, urgency of the undertaken research is quite obvious.

The purpose of the study is to evaluate sustainability of NKO landscapes to agricultural impact and to determine the nature of such impact.