

===== DYNAMICS OF ECOSYSTEMS AND THEIR COMPONENTS =====

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**CHANGE IN STRUCTURE OF LAND USE AND IRRIGATION
UNDER MODERN CLIMATIC CONDITIONS IN THE REPUBLIC OF KALMYKIA**

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The structure of land use is determined by natural and climatic conditions, formed during the historical evolution, and dependent on social and economic circumstances. The analysis of change in the structure of land use in the Republic of Kalmykia is based on statistical data, provided by the Federal Service for State Registration, Cadastre and Cartography in the State (national) reports for the state and use of land in the Russian Federation in 2005-2018. The climatic conditions were evaluated on the basis of monthly air temperature and precipitation data, provided by the Yashkul Weather Station for the period from 1966 to 2017. The analysis of hydrothermal coefficient dynamics allows us to conclude that there is a humid warming in the Republic, which can be also proved by the data on plant communities that have formed on the Peri-Yergenian Plain while being common only for the final stages of restorative succession on the light-chestnut soils. We also concluded that hydrothermal coefficient precisely represents climatic conditions that affect the state and growth of plant cover; therefore it can be recommended for evaluation of climatic conditions in the Republic of Kalmykia.

Agricultural lands of the Republic occupy 92.8% of the land fund, which proves a highly strong anthropogenic pressure on the territory. The forage lands, arable lands and irrigated lands occupy 73.2, 11.1 and 0.6% of the fund. During 2002-2018 the area of forage lands grew by 197.8 thousand ha (3.7%) due to the growth of agricultural lands and reduction of arable lands, which decreased by 105.4 thousand ha (11.2%). The deficiency of water resources became the reason for irrigation development; in the Republic there are 5 large, fully functional irrigating systems. The total length of the main network of irrigation canals in the republic is 1137 km, the length of the network of waste collectors is 633 km. The maximal volume of water intake for irrigational purposes during the period of 1980-2017 was registered in 1990 when it was 723 million m³; in 2010-2017 it was only 120-200 million m³. The area of irrigated agricultural land in the Republic from 2010 to 2018 remained unchanged and equal to 48.3 thousand ha. The imperfection of the design of irrigation and drainage-collector systems and irrigation technique has caused secondary salinization, waterlogging and depletion of irrigated lands. Only 2-4% of irrigated lands in Kalmykia in 2005-2018 are considered to be in fine condition, while 24-29% is rated as satisfactory, and 68-73% as unsatisfactory. The involvement of a large number of long-fallow lands in agricultural circulation is connected not only with socio-economic, but also with climatic changes, namely, with humid warming in the Republic of Kalmykia.

Keywords: land fund, land use, agricultural land, irrigated lands, hydrothermal conditions, Republic of Kalmykia.

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