Assessment of Land Resources Using Environmental Indicators

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Annotation. The article discusses the provision of sustainable development with the help of indicators. Methods for creating a card passport of environmental indicators of land resources in the development of measures within the framework of sustainable development, rational environmental management and improving their use are presented.

Keywords: agroecological, topographic, card passport, indicators, geoecological.

The Republic of Karakalpakstan owns vast areas arable land, but their development requires major irrigation works, in particular, the construction of a collector-drainage network. In the future, for irrigation it is recommended to use land massifs with slightly saline meadow, meadow-marsh and desert-takyr soils, as well as meadow-saline lands within the irrigated zone. Land and water resources are of great strategic importance for the sustainable development of the Republic of Karakalpakstan. According to the developed methodological approach, the problems of the state of land and water resources of the Republic of Karakalpakstan and the ways of rational use are considered in three groups:

- the first one, which includes problems to be solved at the level of the river basin;
- the second, including the problems solved within the irrigated zone of the Republic of Karakalpakstan;
- the third, including problems solved within the irrigated fields.

The main solution to land and water problems at the level of the Amudarya basin is the supply of a guaranteed volume of river runoff to the lower reaches of the river, which is necessary for irrigating all crops. When solving land and water problems within the irrigated zone, it is necessary to take into account the existing natural and economic differentiation with the allocation of the southern, central, northern and Primorsky parts. As is known, the southern zone, in comparison with the northern and Primorsky ones, is characterized by more optimal natural conditions for growing crops and the predominance of labor resources [101, p. 48; 102, p. 9-13; 103, pp.144-147]. For the purposes of practical use, we have compiled a schematic map "Assessment of the lands of the Republic of Karakalpakstan according to the degree of their favorableness for use in agriculture", which took into account the following factors: the degree of salinization of irrigated lands, crop yields, the length of the collector-drainage network, etc. When deciding problems solved within the irrigated fields, it is necessary to carry out their certification, using the data of the "Agro-ecological passport of the field" it is possible to significantly increase their productivity. When compiling an "agroecological field passport", it is necessary to take into account various agrophysical and agrochemical characteristics of irrigated soils.



1 - Picture. Schematic map of indicators of saline agricultural land in the Republic of Karakalpakstan, in % (Reymov A 2022y)

Contents of the Agro-ecological passport of the irrigated field:

1. Topographic (sometimes schematic) map of the irrigated field indicating the area occupied by arable land, roads, irrigation and collector-drainage network, existing buildings;

2. Applied and recommended schemes for the location of irrigated plots for the vegetative period. They are compiled taking into account the following data: surface slope, fine earth thickness, the presence of pebbles, the level of occurrence and indicators of groundwater mineralization, the width and length of irrigation furrows, the flow rate of water supplied to the furrow.

3. Composition of cultivated crops and levels of their productivity. Phenological data for the field under consideration, the planned and actual yield of the cultivated crop reflect the current level of agricultural production on the farm, and demonstrate the achieved degree of possible increase in land productivity.

4. Main agrophysical and agrochemical characteristics of soils. So, the mechanical composition of the soil reflects the morphological structure of the site profile and the associated physical and physico-chemical properties of the soil. Information about the mechanical composition helps to determine the degree of difficulty of mechanized tillage. Its structure, moisture permeability and moisture capacity, which is especially important when choosing irrigation norms.

5. Maps of soil availability with humus, nitrogen, phosphorus and potassium, degree of salinity and mechanical composition for arable (0-30sm) and subsurface (30-100cm) horizons. Knowing the degree of supply of the field with humus, soluble forms of nitrogen, phosphorus and potassium (NPK) allows you to set a reasonable rate of applied fertilizers, and at the same time achieve an equalization of the level of fertility in this field.

6. Information about the yield (for individual collections), sowing date, plant density, as well as the economic efficiency of agricultural production in the area under consideration (gross output, fixed and variable costs, gross and net profit).

If necessary, the ecological passport can be supplemented with fresh data, recommendations aimed at increasing the yield of a given land plot. The passport is a combination of environmental and agro-economic information about the site, allowing farms to choose the right decisions when performing agro-reclamation work on the site, conduct an objective analysis of the dynamics of agricultural production and improve the culture of agriculture. It should be noted that all the problems of rational use of land and water resources at the basin, regional and local levels are quite closely interconnected.

The ecological passport is a combination of agro-economic information about the site, allowing farmers to choose the right decisions when performing agro-reclamation work on the site, conduct an objective analysis of the dynamics of agricultural production and improve the culture of farming. Taking into account various

reclamation indicators (soil salinity, groundwater depth, drainage and crop yields), a schematic map of the territory of the Republic of Karakalpakstan has been compiled, taking into account the degree of land optimality for their agricultural use. At the same time, three categories of land have been identified: a) favorable land for use in agriculture; b) relatively favorable land for agricultural use; and c) unfavorable land. At present, due to the transition of the Republic of Karakalpakstan to market relations, we consider it more correct to switch to the basin principle of geoecological monitorin.

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