PROBLEMY AND PERSPECTIVE ECOLOGIZATION SELSKOGO HOZYAYSTVA NA OSNOVE ECOLOGO-HOZYAYSTVENNAYA OTSENKA TERRITORII

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Annotation. *The greening of land in the context of the agricultural sector is interpreted in the work as the creation of a certain level of involvement of land resources in social production and stable soil fertility, provided by a combination of specific properties of soil regimes. And also, the importance of protective forest plantations in improving the reclamation of irrigated lands was analyzed.*

Keywords: *rational nature management, ecologization, green economy, agrarian sector, protective forest plantations, land resources of protected areas.*

ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ ЭКОЛОГИЗАЦИИ СЕЛЬСКОГО ХОЗЯЙСТВА НА ОСНОВЕ ЭКОЛОГО-ХОЗЯЙСТВЕННАЯ ОЦЕНКА ТЕРРИТОРИИ

Аннотация. *Экологизация земли в контексте аграрного сектора в работе трактуется как создание определённого уровня вовлечения земельных ресурсов в общественное производство и стабильного плодородия почв, обеспеченной совокупностью специфических свойств почвенных режимов. А также, проанализировано значение защитных лесных насаждений в улучшении мелиорации орошаемых земель.*

Ключевые слова: *рациональное природопользование, экологизация, зеленая экономика, аграрной сектор, защитных лесных насаждений, земельных ресурсов ОПТ.*

The increasing anthropogenic pressure on the natural environment during extensive development dictates the need for adjustments in the direction of improving and mitigating the interaction between the social and natural environment. Currently, the "green" economy is a widely known, promising model of sustainable development. There are many approaches, interpretations, points of view only in relation to the very essence of the phenomenon. If we try to present the main approaches, then, apparently, it is worth noting the general economic approach, which means making the “green” economy universal [5, 22].

In recent years, Uzbekistan has taken systematic measures to improve land and water relations, optimize agricultural land and apply a simplified procedure for their allocation, introduce modern market mechanisms, innovative and resource-saving technologies for the use of land and water resources, and produce highly profitable, export-oriented types of products by reducing low-margin cotton and grain areas. The total land area in the Republic of Uzbekistan is 44,892.4 thousand hectares, which are divided into 8 categories depending on the purpose and procedure for using the land, including: agricultural land refers to fertile land, is considered the main means of national wealth, agricultural production and ensuring the food security of the country [1, 2, 3].

The problem of greening the earth is studied by scientists quite closely. Among the scientists are L.E. Kupinets, A.B. Kachinsky, I.I. Mostovoy, B.I. Kochurov, A.G. Isachenko, V.A. O. Abduganiyev and others. However, the theoretical foundations of the ecologization of agriculture and the integral assessment of the suitability of natural landscape lands for agricultural development have not yet been sufficiently developed [12, 14, 15, 24].

To date, more than 20 million hectares of land are used in Uzbekistan's agriculture, including 3.2 million hectares of irrigated sown land, on which food products are grown for the needs of the population, the necessary raw materials for economic sectors. In order to increase the fertility of irrigated areas, improve the reclamation state and water supply, large-scale irrigation and reclamation measures are being carried out within the framework of state programs. As a result of the irrational use of agricultural land for many years, the natural fertility of the soil and crop yields decrease, the quality of products deteriorates, and environmental pollution increases [3, 18, 19].

In order to improve the efficiency of the use of agricultural land and water resources, the President of the Republic of Uzbekistan Sh. Mirziyoyev signed a decree “On measures for the efficient use of land and water resources in agriculture” (June 17, 2019 No. UP-5742). On the basis of the decree, a concept was developed for the efficient use of land and water resources in agriculture. The main direction of the concept: Improving the efficiency of agricultural land use; increasing the efficiency of water use and hydraulic structures, improving the reclamation state of lands; development of selection and seed production of agricultural crops; deep processing and sale of agricultural products, development of logistics and marketing systems; accelerating the integration of science and practice in the efficient use of land and water resources.

In order to overcome negative trends in the development of agriculture, to solve the food problem as soon as possible, it is advisable to have a comprehensive program for the greening of agriculture, which includes two subprograms: the greening of agriculture, the accelerated development of the production and marketing sphere of agriculture. The most important direction in solving the problem of sustainable

development of agriculture and agriculture in general is to ensure simple and expanded reproduction of the natural fertility of soils. The ways of implementing this direction should be envisaged when developing a subprogram for the creation of a regional ecological network [13, 16, 17].

The ecological network is designed to ensure the most effective ecological stability of the territory by maintaining a flexible system of differentiated nature management. In the long term, the ecological framework does not reduce, but increases the economic return of the regulated, sparing economic use of land. These primarily include the fight against soil erosion, the use of organic fertilizers, agroforestry, cultural and technical reclamation, grass planting, liming of acidic soils, minimization of technogenic impact on soils, soil protection technologies, biological methods of plant protection, optimal crop rotations, clean fallows, etc. [4, 17, 23].

These measures to improve the quality of soils are "soft", they do not make drastic changes in the ecological balance of agroecosystems, but, on the contrary, increase soil fertility. These measures should be given priority in relation to "deep" reclamation (primarily hydraulic engineering), the widespread use of chemical means of production - mineral fertilizers and pesticides, the use of powerful equipment in agriculture with a large load on the land. In general, the pace of land degradation, the decline in natural soil fertility is now significantly ahead of the pace of environmental measures.

Accelerating the implementation of environmental protection and environmental improvement measures allows, along with the environmental effect, to obtain significant economic benefits. Thus, capital investments in the fight against soil erosion are characterized by high economic efficiency. Along with high environmental and economic efficiency, the greening of agriculture also has a huge social effect. This is manifested primarily in improving the health of the population as a result of an increase in the consumption of biologically clean agricultural products, a decrease in pollution of water and land resources, and the air basin [6, 7, 20, 21].

Greening agriculture is a sub-program for the accelerated development of the production and marketing sector, the implementation of which makes it possible to improve the use and eliminate the loss of agricultural raw materials. Accelerating the development of infrastructure (roads, storage, trade, etc.) and processing industries (food and light) is important for stabilizing the environmental situation and solving the food problem. In agriculture, there were no more free lands, the cultivation of which would make it possible to compensate for the decline in the productivity of the "old" agricultural lands. However, within the framework of the used areas, the quality of the land fund deteriorated, land degradation occurred. The "offensive" of cities, industry, infrastructure leads to the withdrawal of many valuable agricultural lands. Instead, in order to maintain the land balance, lands with lower soil fertility are now being developed, as a rule. The intensification, redistribution and concentration of part of the means of production in agriculture make it possible to compensate for the

reduction in land resources by increasing the final output of products, i.e. by reducing today's huge losses of potential crops in the process of its transformation and movement to the consumer [5, 6, 7].

The hottest weather over the past 150 years was observed in Uzbekistan 3 of the last 5 years. Climate change will also have a negative impact on food security. By 2050, production of corn, rice and wheat is estimated to drop by up to 25 percent. Also, in the context of global climate change, along with an increase in the need for water resources, this is the reason for the untimely implementation of standard agrotechnical measures on irrigated lands.

Ecological and economic optimization in agricultural regions will depend on the share of arable land. Intensively used, it is the main destabilizing factor and is capable of destroying the entire agricultural landscape. In 2018, about 70% of arable land in Uzbekistan was used for cotton and wheat production. Over the past few years, some land has been taken out of cotton and wheat cultivation. However, in order to have a greater effect on agricultural development, additional areas currently used for growing these two crops must be taken out and then transferred to other, more profitable crops, in particular fruits and vegetables.

According to World Bank estimates, reducing the area of cotton and wheat in Uzbekistan, for example, to 50% of the sown area, will lead to an increase in gross agricultural output by 51%, employment in agriculture will increase by 16%, and water savings by 11% [3]. Therefore, it is necessary to develop systems of adaptive-landscape agroforest reclamation arrangement of arable lands. Forest reclamation measures to protect the soil from wind and water erosion and improve the microclimate provide for the creation of a system of forest plantations. The system of protective forest plantations is understood as a set of forest belts and small tracts interconnected by their influence on the adjacent space, expediently located on the territory of land use or land ownership, taking into account the terrain and the state of the soil cover.

Thus, degraded pastures will belong to lands with high anthropogenic transformation and will remain in the numerator, while cultivated pastures will be transferred to sustainable landscapes and transferred to the denominator. Hence, the modified coefficient of relative intensity of the ecological and economic state of the territory ($ЭХХ_{Ко}$) for agroregions will have the following form (1):

$$ЭХХ_{K_o} = \frac{П_н + Пр + З + П_д}{П_э + ЛФ + ОПТ + Мн + С + П_к + З_з}, \quad (1)$$

where, $П_н$ and $П_э$ – unprotected and protected by forest belts arable land, $Пр$ – industrial lands, $З$ – under development, $П_д$ and $П_к$ – degraded and cultivated pastures, $ЛФ$ – forest fund, $ОПТ$ – protected natural areas, $Мн$ – perennial plantations (gardens), $С$ – hayfields, $З_з$ – reserve lands [11].

The existing forest belts in central Fergana are in need of reconstruction and agrotechnical and silvicultural maintenance. It has been determined that the most

environmentally friendly and cost-effective way to protect against negative processes is the creation of protective forest plantations. Field-protective forest belts, 12-15 m wide, are placed on arable lands in plain conditions and on watersheds to protect fields from the harmful effects of strong winds and wind erosion (dust storms).

Water-regulating forest belts up to 15 m wide and shrub backstage. They are placed on arable slopes to regulate surface runoff, snow distribution, reduce water erosion of the soil, and improve the microclimate of fields. Balcony and ravine forest strips 15-21 m wide, located along beams and ravines, and ravine-gully forest plantations inside beams and ravines to regulate surface water runoff, stop water erosion, and improve the microclimate in adjacent fields.

Protective forest plantations around irrigated lands also serve as biological drainage. Trees, as natural drainage, evaporate excess groundwater depending on the relative humidity and temperature of the area. Biological drainage serves to improve soil conditions, prevent pollution and lower groundwater levels. Trees such as willow, poplar, alder and alfalfa, which have the ability to evaporate a lot of water through their leaves, act as biological drainage.

For example, during the growing season, willow and poplar evaporate up to 20-100 m3 of water, and a grove, which occupies 1.5% of the irrigated area, takes out 15% of the salts released by drainage. Alfalfa consumes 4-20 m3/ha of water. Up to 78% of this amount falls on the contribution of groundwater. In summer, when plants consume a lot of water, the groundwater level in meadows is 50-70 cm deeper than in cultivated fields. In the desert and semi-desert zones of Uzbekistan, poplar, willow, sycamore, maple, white locust, etc. are widely used to improve land reclamation. Each of the willows, poplars, lindens, sycamores and other plants in the protected grove will evaporate up to 200 m will perform a unique function of "biological drainage", that is, the intensity of water evaporation in them depends on whether the year is wet or dry [10]. Due to the above features of trees, the irrigation rate in the cotton-growing regions of Central Asia has decreased by 30-50%. One hectare of forest purifies 18 million m3 of air per year or humidifies and cools 10 times more air than 1 ha of a reservoir [9].

Forest plantations in the protected zones of reservoirs strengthen the banks, prevent pollution and shallowing of reservoirs, maintain water balance and serve as a recreational zone. With an increase in the area of tree plantations by 10%, the amount of water runoff can increase by 0.42 l/s per km2 of area. The forest is an active environment-former and a universal regulator of river flow. According to G. Pauliukevičius, 1 ha of forest in sandy plains increases river runoff by 200 m3, in loamy and clayey plains by 70 m3, and in hilly landscapes by up to 150 m3 [8].

The proposed scheme of protective forest plantations (PFN) will increase the protective forest cover from 2 to 5%, and the adaptive landscape arrangement of the territory will reduce the coefficient of relative intensity of the EHS to 0.5 [11]. This will create a reserve for the development of animal husbandry. In addition to the types of

reclamation plantations listed above, which are the main ones for agricultural production, there are others that take into account the specifics of the protected area:

a) forest strips on irrigated lands along irrigation and waste channels to reduce water evaporation, lower the groundwater level, protect fields from strong winds "garmsil" and dust storms; b) forest strips on drained lands, along drainage canals to protect them from falling asleep and developing in the fields of wind erosion;

c) forest strips in orchards, vineyards and other areas to reduce wind speed and improve the microclimate;

d) forest plantations around ponds, reservoirs, along rivers and in openings to retain solid runoff, protect against destruction of banks, erosion and sand drift of river floodplains;

e) forest strips and clump plantings on pasture lands to increase the productivity of pastures and protect animals from wind and heat;

f) rocky, clump and massive forest plantations on broken sandy soils not used in agriculture to fix sands and turn them into productive lands;

g) strip, clump and massive forest plantations on mountain slopes to reduce surface water runoff and prevent the formation of mud and stone (mudflow) flows;

h) forest belts along roads to protect against sand and snow drift i) protective and decorative plantings in rural settlements, around them for environmental improvement and aesthetic education;

j) forest plantations on the dumps of mine workings for their reclamation, i.e. for growing timber and other economic use.

It is important to note that the development of agriculture with a reduction in cultivated areas and the concentration of resources in agriculture does not mean a mechanical increase in the amount of means of production per unit of cultivated land. Qualitatively different approaches are needed, the ecological intensification of agriculture based on a high level of agriculture, the implementation of simple and extended reproduction of soil fertility based on the development of optimal crop rotations, the use of clean fallows, environmentally compatible means of production, the rational use of fertilizers, etc.

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