Resource potential of land use in land management

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Abstract. In the article, the author proposes to use the resource potential in the development of land management projects. Resource potential in the author’s understanding is the entire set of resources of land use, land plot, field or administrative-territorial entity, capable of creating benefits for its owner, user, resident population or interested entrepreneurs. As an integral characteristic, the resource potential is capable of providing a more uniform design of crop rotations, providing a uniform and more accurately predicted yield. At the level of administrative management of territories, the resource potential can become the basis for the integrated zoning of the territory for a more differentiated land and agricultural regional and municipal policy, the development of targeted support schemes for agricultural producers, etc. In addition, the resource potential has a high ability to automate the calculation and include it in digital control systems of the agro-industrial complex or automated design systems for land management.

1. Introduction
While specialized literature, in scientific research and in practice, the resources of an enterprise or the resources of a project being implemented or proposed for implementation are discussed, in modern scientific discourse it is initially assumed that it is not only about financial or production resources, but about the entire set of resources of the enterprise (project): financial, human, production, labor and others. Land use plays a key role in the activities of agricultural producers [1, 7]. Therefore, in the author’s opinion, it is unfair to speak about the resource potential of land use exclusively from the perspective of soil fertility level.

A number of publications [5] substantiate the need to use the term resource potential as a generalizing indicator reflecting the potential ability of agricultural land use to bring benefits to its owner and user. In this case, the generation of benefits can be carried out not only due to the productive qualities of soil varieties located on the territory of land use. Land use can also generate material and other benefits due to better transport accessibility, a prestigious location or more intensive use.

In the theory and practice of land appraisal, the remainder method is widespread, which is a modification of the income approach, in which a part of the income from the use of the appraised object that remains after remuneration of labor, capital and talent of the entrepreneur is recalculated into value. This is the part formed by all the characteristics of land use that can influence cash flows from land ownership.

In essence, the resource potential, as understood by the author, is the reason that allows land use to provide income. Resource potential of a land use is the ability of an agricultural land use to provide benefits to its owner and/or user based on a pool of resources concentrated in land use.
2. Materials and methods
Land use, as a part of a complex natural, economic and social system—the land use system—has been developing over time under the influence of a wide variety of external and internal forces: relief, surface and underground waters, soil cover, the sum of active temperatures, prevailing winds, slope exposure and other natural and climatic characteristics form the land use system as part of the nature management system. The natural properties of the land formed under the influence of these factors, such as fertility, suitability for the cultivation of certain crops, soil stability, the presence of minerals in the depths, suitability for the construction of objects for various purposes, relief, the presence of especially valuable lands and natural objects, etc. have an impact on the size of land use, their boundaries, value and composition of land, location on the territory and type of use. This is the process of forming a land use system in the process of natural and climatic development.

The totality of state, regional and local regulatory legal acts in force and acting in the territory under consideration affect how many types of rights are currently valid in a given territory, what rights they are, what content they are filled with, who can be the rightsholder, do they exist, and what are the restrictions on the use of land, how and who records and registers rights to land, etc. Note that it is necessary to consider not only the current legal environment, but also the previous one, since it has a prolonged impact on land and property relations. For example, landowners may have rights over which land plots are no longer granted but remain in effect until they are re-registered, or the impact of preexisting minimum and maximum land plots for a certain permitted use will continue to be active in the land use system for a long time. The described process is the formation of a land use system as a result of legal development.

Under the influence of proximity or remoteness to product markets, to sources of raw materials, labor resources and capital, existing traffic flows and transport and distribution centers, formed basic sectors of the economy for a given territory, the availability of energy sources, the presence of effective demand for manufactured goods and services, social and demographic composition of the population, the structure of settlement, the development of financial institutions and other indicators of the socio-economic development of the territory, the structure of the land fund, the degree of land use, the structure and number of rightsholders, territorial differentiation of land use, the value of land plots, soil pollution and other components of the environment and other factors have formed. This is the general view of the formation of a land use system as a result of socio-economic development.

Each territory has been inhabited by specific peoples and nationalities with their own traditions, crafts, customs, culture, religious beliefs, established forms of labor, collective and individual characteristics. Historical events took place there, historical figures lived, monuments of science, culture and art were formed. All this also created a land use system in terms of the structure of the land fund and rightsholders, the frame of specially protected areas, the presence and composition of protected zones, etc. We propose to call this process the formation of land use as a result of historical and cultural development.

3. Results
Considering the emergence of the resource potential of agricultural land use in the processes of development of the land use system described above, the components of the resource potential should be considered separately. The resource potential, in the author’s opinion, can be divided into component potentials: soil, natural, production, market and location.

Soil potential is determined by the totality of soil and agrochemical characteristics of soils that make up the soil cover of land use. The natural and climatic development of the land use system forms the soil potential of land use in the course of long-term physical and chemical processes. All these characteristics directly affect the yield of agricultural crops, the productivity of forage lands, the yield of agricultural products and, ultimately, the expected cash flows from agricultural production. From a mathematical point of view, the soil potential is the sum of soil and agrochemical characteristics, for comparability, normalized with respect to the extreme values possible in a given area.
Natural potential is also a product of natural and climatic development and includes such characteristics as the sum of active temperatures, the amount of precipitation, the exposure and steepness of the slope, the degree of manifestation of erosion, etc. The natural potential determines the set of crops suitable for cultivation, forms the yield, cultivation costs and other components of the cash flow.

Location potential is already a product of socio-economic development and is represented by factors influencing the logistics of agribusiness, i.e. remoteness of land use from product sales markets, sources of raw materials, labor resources and capital, existing traffic flows, transport and distribution centers, as well as the existing territorial differentiation of land use, etc. The potential of the land use location is responsible for the formation of the cost part of the production processes associated with the assessed land use.

The characteristics reflecting the production potential are formed in the process of both natural-climatic and socio-economic, and legal development processes. Soil and natural potential form the basis for the gross output of products, and the existing legal system and the situation on the commodity markets reflect the demand for products that land use specializes in, as well as its competitiveness.

Market potential shows how attractive land use is from the market perspective. This attractiveness is formed in the process of socio-economic development under the influence of the prevailing combinations of supply, demand, price situation, etc.

The total resource potential is the sum of the described individual potentials.

Resource potential, as an indicator reflecting the entire set of resources inherent in agricultural land use, can and should be actively used in the process of land management in general, and in land management in particular.

The object of assessing the resource potential can be not only land use as a whole, but also individual land plots or individual fields and working plots. Then the results of assessing the resource potential can be actively used in the preparation of projects for the organization of the territory, the projected system of crop rotation, etc. The resource potential directly affects the value and productivity of the field and the working area; therefore, the land surveyor should strive to ensure that the projected crop rotations are uniform and equivalent in terms of the total resource potential, which will ensure a uniform and more predictable yield.

Based on the results of approbation of the use of resource in land use of several agricultural producers of the Tambov region, a positive impact of the use of resource potential in the development of land management projects was established. Aligning the variants of crop rotation systems at the average level allows increasing the accuracy of calculating the indicators of economic efficiency. For example, crop rotations at Zolotaya Niva LLC in the Znamensky District of the Tambov Region were designed to equalize the potential level in crop rotations. As a result, a system of crop rotations was proposed, consisting of fodder and two field irrigated crop rotations. Field irrigated crop rotation No. 1 included 14 working plots (4 plots with a resource potential of less than 9, and 10 plots with higher potential) with an average resource potential of 9.24. The second field irrigated crop rotation consisted of 27 plots (5 with a rating below 9 and 22, with a rating above 9) with an average resource potential of 9.96. The fodder crop rotation included 3 working areas, the average value of the potential of which was 9.98.

Another area of using the resource potential can be the process of involving unused agricultural land into circulation. This problem is currently very acute and deserves attention both from government agencies and from the scientific community [2, 3]. In the process of bringing unused lands into circulation, it is not enough to make an inventory and identify a reserve of land for involvement in economic circulation, but it is also necessary to rank these lands according to the priority of their involvement. The basis for building such a rating, from the point of view of the author, should be the resource potential.

On the basis of the resource potential, zoning of the territory of an administrative-territorial entity can be carried out for a more differentiated policy in the field of agriculture, the development of targeted assistance programs for agricultural producers [6], and the distribution of the tax burden. The figure shows the results of the zoning of the Tambov region by resource potential.
Based on the studies carried out, it can be concluded that the Tokarevsky, Zherdevsky, Sampursky, Mordovskiy and Uvarovskiy districts have the highest soil potential among the districts of the Tambov region. At the same time, the maximum soil potential is 65% of the potentially possible value. Bondarsky, Morshansky and Pichavsky have the lowest soil potential.

In terms of natural potential, the leading positions are occupied by Uvarovskiy, Gavrilovskiy, Kirsanovskiy, Sampurskiy and Zherdevskiy districts. The natural potential of the Uvarovskiy district is 69% of the potential. The Nikiforovskiy, Petrovskiy and Staroyuryevskiy districts have the least natural potential.
By location, the Tambov region is expected to be in the lead, with a potential equal to the maximum possible value. Among the regions with the highest production potential are Muchkapsky, Staroyuryevsky, Gavrilovsky, Inzhavinsky and Pichaevsky. And the minimum rating for this value is in the Tambov region.

In terms of market development, the highest potential is observed in Kirsanovsky, Zherdevsky, Tambovsky, Michurinsky and Bondarsky districts.

After bringing all the potentials together, it can be stated that the spread of the resource potential in the Tambov region is 13.68 rating points (from 9.38 in Bondarsky to 23.05 in Sampur districts). As a result, the territory of the Tambov region was divided into 5 zones. The first zone includes 5 districts, which are distinguished by significant natural potential and minimal values of other private potentials. The second zone (five districts) has good market and natural potential. The third zone stands out with significant potential, location and market potential. The fifth zone (four districts) is characterized by the maximum value of all individual potentials.

4. Conclusion

Thus, the resource potential acts as an integral indicator of the value of agricultural purposes. The resource potential is formed by a cumulative construction of private potentials, including soil, natural, production, market and location potentials. The resource potential can be used at the present stage when carrying out land management and territorial organization. The appearance of an additional integral indicator helps to simplify the justification of the developed management decisions, to increase the visibility of the presentation of the level of resource potential.

In addition, due to a clear calculation algorithm, the resource potential assessment has a high potential for automation and use in automated design systems, which is one of the main trends in the modern development of land management science and practice [7].

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