

INCREASE OF ECONOMIC EFFICIENCY OF AGRICULTURAL LAND MANAGEMENT ON REGIONAL LEVEL

Dariya Vasilieva¹, Alexandr Vlasov², Velta Parsova³, Gabibulla Khasaev²

¹ Samara State Technical University, Russia; ²S.P.Korolev Samara National Research University, Russia; ³Latvia University of Life Sciences and Technologies, Latvia
vasilievadi@mail.ru, mitan63@yandex.ru, velta@parsova.lv, rector@sseu.ru

Abstract. Sustainable economic development of the territory depends on involvement of land resources in economic turnover and increase of efficiency of their use. Land management efficiency at the municipal level in the Russian Federation is complicated by constant changes in land legislation, insufficient funding for measures to eliminate deficiencies in land use and improve the condition of land, inconsistency of governing bodies in the land sphere, the lack of development of the land market. Economic instruments are very important measure within land relations between land users and landowners and the state institutions, associated with payment for land use, mainly with land tax and real estate tax. Land payments are local taxes, therefore they are the financial base of regional budgets and play a significant role in the economic development of regions. Analysis of current system of land payments showed that they do not cover the entire land stock, there is a large number of beneficiaries exempted from payments, land payments are used inappropriately, etc. It means that serious changes should be made in the current system of land payments, and the rate of payments should be clarified. The land market development in relation to agricultural land is at a low level, so, when determining the cadastral value of land plots from agricultural land, it is impossible to use the market approach. Therefore, mainly the income approach is used for the cost, using the method of estimated land rent capitalization. As the territory of investigation Samara region has been chosen. The goal of the article is to analyse mechanisms for increasing the economic efficiency of land management in the category of agricultural land. Analysis of cadastral valuation conducted in 2020 showed that the cadastral value of land plots intended for agricultural production has increased by more than 7 times since 2021 in Samara region. Underdevelopment of agricultural land market in Samara region is connected with prolongation of the region's moratorium on agricultural land privatization till 2024. At present the highest offer prices for land plots are in municipal districts situated in the central and northern agro-climatic zone, near large settlements, which are the main consumers of agricultural products. This does not coincide with the indicators of the cadastral value. Therefore, it is possible to increase the number of disputes with the results of cadastral valuation in courts and decrease the municipal budgets. To valuation are subjected real estate objects registered in the Unified state register of real estate. Currently this register has been formed on the basis of declarations, therefore the database is not sufficiently comprehensive according to the number of objects and qualitative and quantitative characteristics of real estate. Budget income on base of property taxes should take place not only as a result of increase of the cadastral value as tax base. It should be based on registration of real estate objects not only in manner of declarations, but also on improving the efficiency of municipal land control, conducting soil and agrochemical surveys of agricultural land.

Keywords: cadastral valuation, land fees, land management, agricultural land, land market.

Introduction

Management of land resources at regional level plays a very important role in the sustainable socio-economic development of the territory. The purpose of land resources management is to meet the state and public needs: improvement of economic, social and environmental living conditions of people; formation of economically and socially justified system of payments for land; preservation and restoration of the natural environment, prevention of land resources degradation; development of business and social activities, etc. Land resources management is carried out at different levels: national (it is carried out by state bodies, it has a territorial nature and applies to all categories of land regardless of the rights to the land plot); departmental or branch management (carried out by ministries, committees, federal services, has no territorial nature); local or municipal management (entrusted to self-government bodies, carried out on the territory of municipalities – administrative areas, cities, towns, etc.) [1; 2].

Each municipality in the Russian Federation has its own local budget. The budget of a municipal district and the combined budgets of the urban and rural settlements comprising the municipal district constitute the consolidated budget of the municipal district. Article 15 of the Tax Code of the Russian Federation establishes that local taxes include only two taxes: land tax and personal property tax. Local taxes and fees are mandatory in the territory of the respective municipality. The basis for calculating the land tax is the size of the cadastral value of one hectare of the corresponding category of the land fund

of the municipality [3]. Therefore, valuation of land can be a mechanism for increasing the economic efficiency of land fund management. The issues of relevance and reliability of cadastral valuation data are now actively discussed in the scientific literature. Thus, on the urban land use example in Poland, it is shown that the basis of significant losses to the budgets of local governments are outdated cadastral data [4]. An important issue is the development of new models of land valuation that meet modern situations, which is considered on the example of the creation of a multi-criteria land valuation model in land consolidation in Turkey [5]. The formation of the cadastral value of land in conditions of a developed land market is based on the market value, which is determined on the basis of the average price by summarizing the mass data on the prices of purchase and sale of similar plots. The market value is influenced by a variety of factors, including the possibility of changing the type of land use and zoning [6; 7], the size of a land plot of agricultural land [8], and others. The example of agricultural land in Italy shows that a developed land market is influenced by environmental, historical, and cultural factors not directly related to agriculture [9].

The aim of the article is to analyze economic instruments as a mechanism of increasing efficiency of land fund management in the region on example of Samara region. To achieve this goal the following tasks were set: 1) to study the mechanisms of formation of the cadastral value underlying the accrual of land payments; 2) to study the indicators of the market value of agricultural land in different municipal districts; 3) make a forecast of changes in the collection of land payments.

The cadastral valuation experience in the subject of the Russian Federation Samara region described in this paper is an interesting example for scientists from different countries as a variant of land payment tax system formation in the conditions of undeveloped land market and existence of moratorium on agricultural land privatization. The article proposes mechanisms to improve economic management of land resources at the regional level through engineering and agrochemical measures.

Materials and methods

Samara region occupies an area of 53.6 thousand km² (0.31% of Russia's territory) and is part of the Volga Federal District and the Volga economic region. The region is situated in the south-eastern part of the European territory of Russia, in the middle course of the Volga river. Samara Region consists of 10 urban districts and 27 municipal districts. According to the report on the condition and use of lands in Samara region, the structure of the land fund of the region is as follows: agricultural land – 75.9%, forest land – 10.3%, settlement land – 6.7%, industry, transport and other special purposes – 1.3%, specially protected nature territories – 2.6%, water fund land – 3.1%, reserve land – 0.01% of the area [10; 11].

Agricultural land is land beyond the borders of settlements provided and designated for the needs of agriculture. This land is used by agricultural enterprises, organizations for production of agricultural products, research and educational purposes, by citizens for farming, personal subsidiary plots, gardening, horticulture, cattle breeding, haymaking and cattle grazing.

To establish the cadastral value, the state cadastral appraisal of land is carried out, and two approaches are used: market and income approach. The market approach shows the most realistic results; in conditions of developed land market, the price of land plot is the amount which buyer is ready to pay to satisfy his interests. The market price of land plot is determined on the basis of average price by summing up mass data on prices for similar land plots.

At the moment Samara region is one of the few regions of Russian Federation, in which in accordance with current norms of the regional law "On land" moratorium on privatization of agricultural land has been established until January 1, 2024. Therefore, the primary market of sale of agricultural land in Samara region is not developed: the sector of sale of agricultural lands stably takes 3-4% of the total land market volume, although this category of land occupies more than 75% of the area [12].

The purchase and sale of agricultural land was permitted in the Russian Federation in July 2002 by the Federal Law "On turnover of agricultural land", but the problem of underdevelopment of the land market is typical for the whole country. Therefore, the cadastral valuation of agricultural land is carried out mainly by the income approach, using the method of capitalization of the calculated land rent [3]. The rent is a regularly received income conditioned by natural and economic conditions of its formation that are stable in time and space.

Results and discussion

Improving economic efficiency is the most important objective of land management. Currently, one of the main forms of land payment regulation is an increase in the cadastral value of land plots, which has certain limitations. For example, the existing mechanism of disputing by the owner of a land plot its cadastral value in court, on the basis of the excess of the cadastral value of the land plot over the market value. The state cadastral valuation is subject to the objects of real estate registered in the unified state register of real estate. Currently the real estate registry is formed by the Rosreestr on the declarative principle and the database is not sufficiently complete either in terms of the list of objects or in terms of qualitative and quantitative characteristics of real estate [13]. Filling of the budget with property taxes should take place not only as a result of increasing the cadastral value as a tax base. It should be based on formation of the list of real estate not only in the application procedure, but also on improving the efficiency of municipal land control, soil and agrochemical surveys of agricultural land, which were not periodically conducted in the region. At the same time, the agrochemical service station "Samarskaya" carries out regular observations of the state of land resources according to the methodological guidelines of the Department of Chemicalization and Plant Protection. Monitoring is carried out on 10 separate specially fixed reference points (5 – in northern zone, 2 – in central and 3 – in southern) and is characterized by continuity of research over time. Its main purpose is to continue control over the dynamics of soil fertility and agro-ecological situation of agricultural land [14].

The land market development, as well as maximum approximation of cadastral and market values of land plots, largely contributes to the increase of economic efficiency. The cadastral valuation of agricultural land was carried out in Samara region in 2020 and came into effect from January 1, 2021 for a period of 2 years, at that all the earlier decisions on cadastral valuation were cancelled. The total area of all plots that were subject to reevaluation was 4.5 million hectares, of which 4.4 million hectares were agricultural land. According to the data of the Ministry of Property Relations of Samara Region total cadastral value of land of this category increased by 23.45% and made 184.7 billion RUB instead of 149.6 billion RUB. However, in some districts due to specification of indicators of soil fertility the cadastral value of agricultural land decreased by 1.67%. At present the average level of cadastral value of agricultural lands varies in the range from 1.23 to 4.33 RUB·m⁻² (Fig. 1).

It should be noted that municipal districts of Samara region differ significantly in the structure of agricultural land and in the average price of agricultural land (Fig. 2). The greatest number of offers is noted for Volzhsky (22%), Stavropolsky (27%) and Krasnoyarsky (8%) districts of the region. No offers in the open access were revealed for a number of municipal entities. Prices of offers for land plots in 2020 varied widely due to a variety of soil and agroclimatic conditions, as well as economic conditions (availability of demand for agricultural products and markets, remoteness of fields from product reception and processing points, availability of labor resources, etc.). Since agroclimatic conditions of Samara region are very diverse, the soil cover of the region is also diverse and heterogeneous. The most valuable and fertile soils are located in the northern part of the region, the least valuable – in the southern part. Spatially on the territory of Samara region there are southern, central and northern climatic zones, distinguished by value of agricultural land.

The northern zone includes the territory of eight municipal districts: Elkhovsky, Isaklinsky, Kamyshlinsky, Klyavlinsky, Koshkinsky, Sergievsky, Chelnovershinsky, and Shentalinsky. It is characterized by high humidity with an average annual rainfall of 430 - 550 mm and an average annual air temperature of + 3 °C. Bioclimatic potential productivity of arable land of the northern zone on grain crops is 29.9 c·ha⁻¹. It concentrates 23.3% of agricultural land in Samara region. In 2020 the northern zone exhibited 17% of the total volume of agricultural land proposals, the offer price range from 6.3 to 65 thousand RUB·ha⁻¹.

The central zone includes Bezenchuksky, Borsky, Bogatovsky, Volzhsky, Kinelsky, Kinel-Cherkassky, Krasnoyarsky, Pokhvistnevsky, Privolzhsky, Stavropolsky, Syzransky and Shigonsky districts. Average annual precipitation is 350-506 mm, average annual air temperature is 4.0-4.4 °C. Bioclimatic productivity potential of arable land of the central zone for grain crops is 24.7 c·ha⁻¹. Traditionally, the share of the central zone accounts for the bulk of market offers. In 2020, the central agro-climatic zone accounted for 74% of the total volume of the market. The price range of proposals is very wide from 4.2 to 214 thousand RUB·ha⁻¹. The most expensive offers are observed for small plots in Volzhsky and Stavropolsky districts located near large cities of Samara and Togliatti.

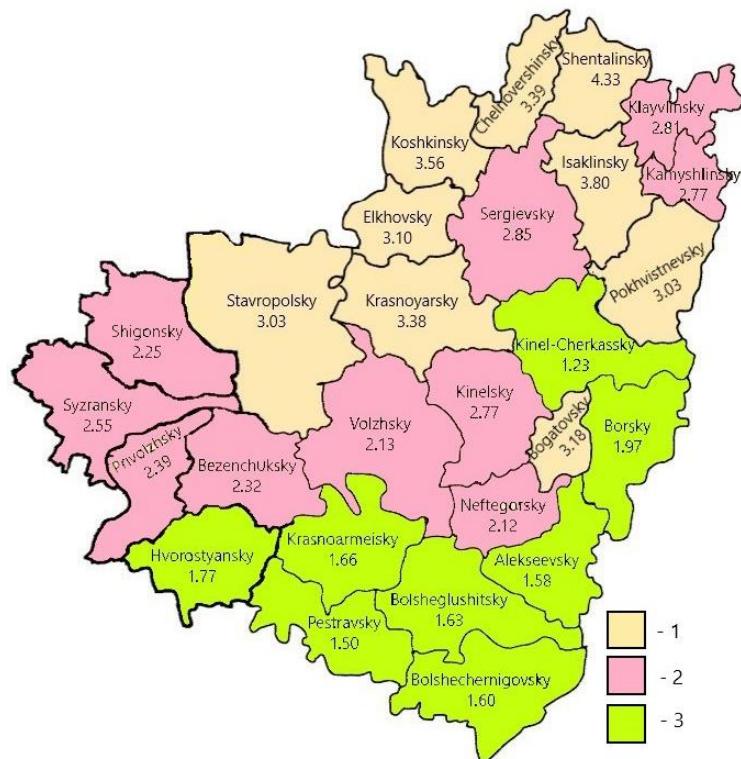


Fig. 1. Average level of cadastral value of agricultural land:
1 – more than 3 $\text{RUB} \cdot \text{m}^{-2}$; 2 – 2-3 $\text{RUB} \cdot \text{m}^{-2}$; 3 – less than 2 $\text{RUB} \cdot \text{m}^{-2}$

The southern zone is the territory of six municipal districts: Alekseevsky, Bolsheglushitsky, Bolshechernigovsky, Krasnoarmeisky, Neftegorskyy, Pestrevsky, Hvorostyansky. Average annual amount of precipitations is 350-360 mm, average annual air temperature – 4.6 °C. Bioclimatic potential for grain crop yields in the arid southern agroclimatic zone is 35% lower than in the northern agroeconomic zone ($22.1 \text{ c} \cdot \text{ha}^{-1}$). In 2020 in the southern zone 10% of the total volume of offers of agricultural land was exhibited. The price range of the proposals is from 3 to 52 thousand $\text{RUB} \cdot \text{ha}^{-1}$.

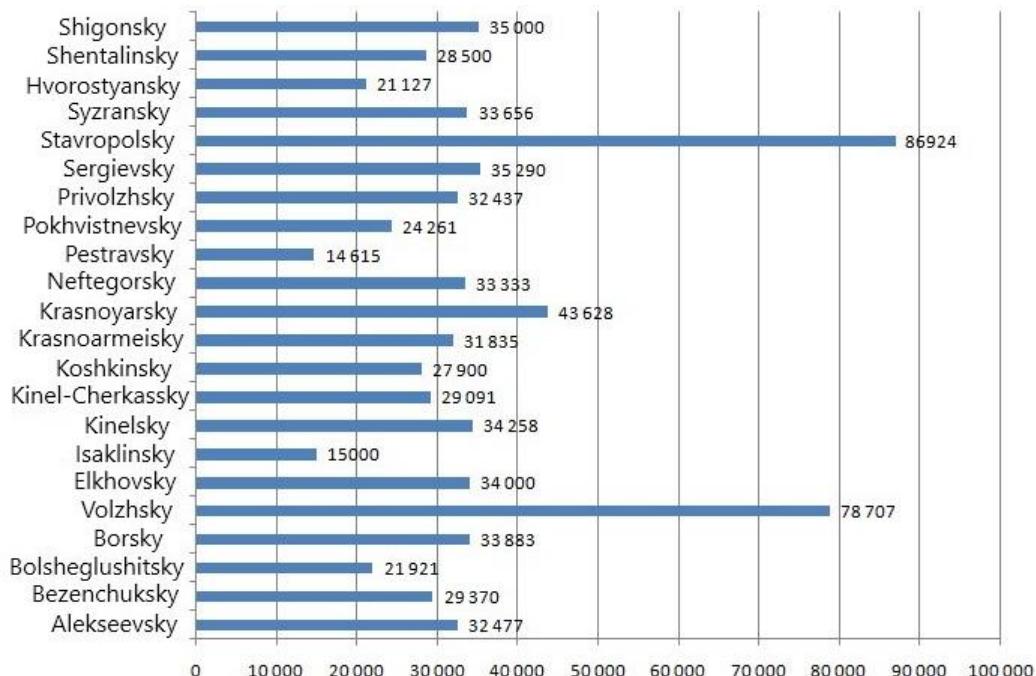


Fig. 2. Average offer prices for sale of farmland in 2020

Average bid prices by agroclimatic zones of the region for rainfed (non-irrigated) arable land are as follows (Table 1).

Table 1

Average bid prices by agroclimatic zones of the region (for rainfed cropland)

Agroclimatic zone	Average bid prices, RUB·ha ⁻¹ (excluding bargaining discount)
Northern	31746
Central	44648
Southern	26836

The highest bid prices are characteristic for municipal districts located in the central and northern agroclimatic zone, near large settlements, which are the main consumers of agricultural products.

The dynamics of supply prices for the period from 2018 to 2020 is shown in Figure 3. The values shown in the chart are adjusted for the average bargaining discount (starting in 2019, the bargaining discount in this market sector has increased significantly, from 2016 to 2018 – 15%, starting from 2020 – 25%).

The main price-forming factors for land intended for agricultural production are: location (natural and climatic potential, remoteness from the regional center, from the reception, storage and processing of agricultural products, availability of human resources), soil fertility, availability of irrigation, investment attractiveness of the municipal district, proximity of paved roads. Agricultural land productivity is also affected by relief and configuration, mechanical composition, degree of erosion, technical condition of lands, possibility of irrigation, etc.

Incorrect nature of some cadastral valuations conducted in the region led to the difference of cadastral value from the market indicators. The difference in the level of cadastral and market values of land plots was the basis for disputes in courts, where a large number of positive decisions were made to reduce the cadastral value. As a result, this led to a significant shortfall in land payments to the budgets of municipalities.

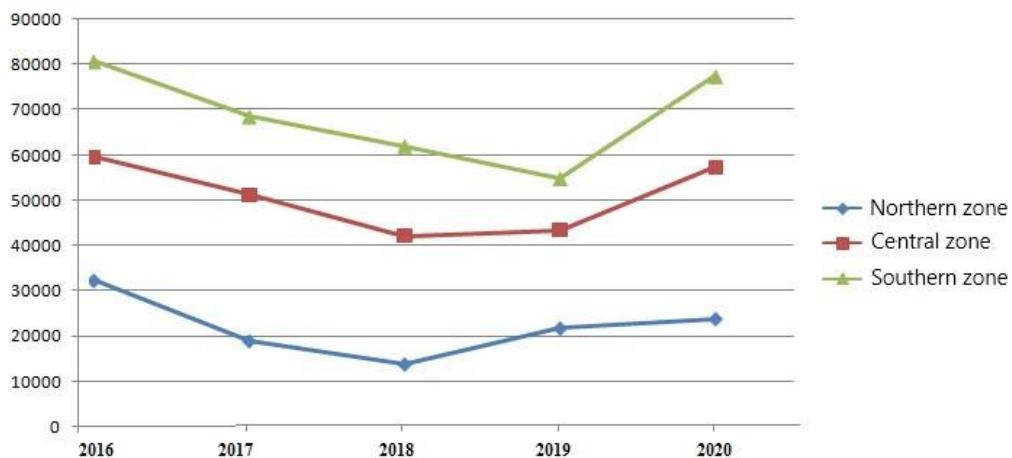


Fig. 3. Proposition price dynamics, 2016-2020

Analysis of cadastral valuation conducted in 2020 showed that the cadastral value of land plots intended for agricultural production has increased by more than 7 times since 2021 in the Samara region. Herewith, the cadastral valuation was performed on the basis of income approach, not the market one, which is connected with underdevelopment of the land market in the region. When calculating the cost, there were taken into account soil differences, normative crop yields, average annual market prices for agricultural products, the amount of costs for cultivation and harvesting of agricultural products, and natural factors. When comparing the cadastral value in municipal districts of the region with the market indicators, one can see their discrepancy, for example, the highest offer prices on the market are typical of Volzhsky and Stavropolsky municipal districts, which does not correspond to the average cadastral value of agricultural land (2.13 and 3.03, accordingly) in these districts. And vice versa, the districts

with the highest values of the cadastral value (Shentalinsky district – 4.33, Koshkinsky district – 3.56, Isaklinsky district – 3.80, Chelno-Vershinsky district – 3.39), located in the north of the region, are notable for high prices of land plot offers (and Isaklinsky district even has one of the lowest offer prices in the region).

Thus, the analysis of the cadastral value of agricultural land, which was put into effect in the region since 01.01.2021, showed that the state and municipal authorities, in order to obtain actual results of the cadastral valuation and to increase the economic efficiency of land resources management, should carry out engineering works related to the specification of area characteristics of land plots and not only use methods of increasing the cadastral value of land plots.

Conclusions

1. The budget should be filled with property taxes not only as a result of increasing the cadastral value as tax base. It should be based on formation of a list of real estate not only in a declarative manner, as well as on increasing the effectiveness of municipal land control, soil and agrochemical surveys of agricultural land.
2. The land market with regard to agricultural land in Samara region is not developed, which is connected with the extension of the moratorium on privatization of agricultural land in the region till 2024. The highest bid prices are typical of municipal districts located in the central and northern agro-climatic zone, near large settlements, which are the main consumers of agricultural products.
3. Introduction since 2021 of the new cadastral value of land plots intended for agricultural production has led to an increase in the taxable base by more than 7 times. The discrepancy between the market and cadastral values may lead to an increase in the number of disputes of the results of valuation in courts.

References

- [1] Varlamov A.A., Zhdanova R.V., Rasskazova A.A., Borodina O.B., Galchenko S.A. Assessment of the resource potential of agricultural land use for land management purposes. International Symposium “Earth sciences: history, contemporary issues and prospects”. IOP Publishing, 2020. p. 012143. DOI: 10.1088/1755-1315/579/1/012143
- [2] Khasaev G., Vlasov A., Vasilieva D., Parsova V. Trends of development of agrolandscapes in Samara region as result of land reform. Engineering for Rural Development. Proceedings. 2018. pp. 630-634. DOI: 10.22616/ERDev2018.17.N244
- [3] Maxt B.A., Rudi B.A. Кадастровая оценка земель сельскохозяйственного назначения (Cadastral valuation of agricultural land) Omsk: RUSINCO Publishing House: Омск, Издательство «РУСИНКО», 2003. 169 p. (In Russian).
- [4] Cienciała A., Sobolewska-Mikulski K, Sobura S. Credibility of the cadastral data on land use and the methodology for their verification and update. Land Use Policy, Volume 102, 2021, 105204, DOI: 10.1016/j.landusepol.2020.105204.
- [5] Tezcan A., Büyüktas K., Akkaya Aslan Ş.T. A multi-criteria model for land valuation in the land consolidation. Land Use Policy, Volume 95, 2020, 104572, DOI: 10.1016/j.landusepol.2020.104572.
- [6] Drapikovskyi O., Ivanova I., Renigier-Bilozor M., Źróbek S. How to assess the impact of hope on a change in the use of land on market value? Land Use Policy, Volume 97, 2020, 104746, DOI: 10.1016/j.landusepol.2020.104746.
- [7] d'Amato M., Zrobek S., Renigier Bilozor M., Walacik M., Mercadante G. Valuing the effect of the change of zoning on underdeveloped land using fuzzy real option approach. Land Use Policy, Volume 86, 2019, pp 365-374, DOI: 10.1016/j.landusepol.2019.04.042.
- [8] Ritter M., Hüttel S., Odening M., Stefan Seifert S. Revisiting the relationship between land price and parcel size in agriculture. Land Use Policy, Volume 97, 2020, 104771, DOI: 10.1016/j.landusepol.2020.104771.
- [9] Sardaro R., La Sala P., Roselli L. How does the land market capitalize environmental, historical and cultural components in rural areas? Evidences from Italy. Journal of Environmental Management, Volume 269, 2020, 110776, DOI: 10.1016/j.jenvman.2020.110776.

- [10] Доклад о состоянии и использовании земель Самарской области в 2018 году (Report on the state and use of lands in Samara region in 2018). Управление Федеральной службы государственной регистрации, кадастра и картографии по Самарской области. Samara, 2019. 77 p. (In Russian).
- [11] Kondolskaya, A., Vasilieva, D., Parsova, V., Antropov, D. Problems of conservation and use of agricultural land in urban agglomerations. 18th International Scientific Conference Engineering for rural Development Proceedings, 2019, pp. 774-779. DOI: 10.22616/ERDev2019.18.N108
- [12] Хасаев Г.Р., Власов А.Г., Васильева Д.И., Климовский А.П., Лобанов В.П., Володина Т.В., Сафонова О.В. Анализ динамики собираемости земельных платежей в субъекте РФ (на примере Самарской области) (Analysis of the dynamics of land payment collection in the subject of the Russian Federation (the example of the Samara Region). Izvestia of Higher Education Institutions. Geodesy and Aerial Photography. Известия высших учебных заведений. Геодезия и аэрофотосъемка, 2016, № 6. pp. 55-63. (In Russian).
- [13] Alakoz V.V, Nosov S.I., Ogleznev A.K., Bondarev B.E. Contrast of soil cover as a factor of land suitability for agricultural production. Urbanization: Challenge and Opportunity for Soil Functions and Ecosystem Services. Springer, 2018. pp. 195–198. DOI: 10.1007/978-3-319-89602-1_23
- [14] Горянин О.И., Обушенко С.В., Джангабаев Б.Ж., Щербинина Е.В., Пронович Л.В. Эффективность применения удобрений в засушливых условиях Поволжья (Fertiliser efficiency in the dry conditions of the Volga region). Farming: Земледелие. 2020. No. 8. pp. 29-33. DOI: 10.24411/0044-3913-2020-10806 (In Russian).